The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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The Russell & Erwin Manufacturing Company's Exhibit at The Exposition Universelle, Paris, 1878.

One of the most interesting exhibits in the American Section is that of the Russell & Erwin Manufacturing Company. It is installed in a heavy black walnut case, 25 by 12 feet and 15 feet high, very simple in its style, but very elegant. In this case is a comprehensive display of builders' and general hardware and tools, embracing over 4000 distinct representative specimens of all classes and grades, from ordinary cast and wrought-iron goods up to the finest descriptions of artistic architectural fittings in statuary bronze, nickel, gold and enamel for door, window and fire-place decoration. To give even a concise statement of the different articles exhibited would require nearly a reprint of their extensive catalogue. It should be noted, however, that notwithstanding the large number of specimens, there are no duplicates. In some respects every article exhibited differs from every other one. The exhibit includes a great variety of the various qualities and styles of door locks, padlocks, handles, bolts, hinges, fire irons, pulleys, sheaves, augers, bits, chisels, gouges, bit-stocks, hollow augers, screw-drivers, screws, wrenches and general tools for joiners' use. Some of the locks exhibited are marvels of beauty and taste, and others are equally marvels of cheapness and security. There is a series constructed in a novel and ingenious system, in which no key whatever is required upon the inside of the door either for locking or unlocking, and its use upon the outside is necessary only for unlocking. This lock also possesses the advantage of having a very small keyhole, which renders it extremely difficult to introduce instruments of sufficient strength either to pick or injure the mechanism. Its key is made of flat spring steel, and while it is of convenient shape, light, strong and portable, possesses no sharp-pointed or triangular bits to scratch the hands or wear the pockets. In use it acts by one simple thrust to adjust the tumblers and throw the bolts. This lock has an advantage over ordinary locks in the following particulars: In ordinary locks the action of the key is composed of two elementary motions; the first consists of a simple insertion of the key into the the lock; the second, of a turning motion through an entire or partial revolution. In this second movement the key not unfrequently becomes caught and entangled by the tumblers, so that it can only be withdrawn with difficulty even by one familiar with the mechanism; this has been the case more particularly with the previous kinds of flat-keyed locks. An important peculiarity of this invention is that this second and most annoying motion of turning is dispensed with, and the key operates by the simple act of insertion to adjust the tumblers, throw the bolt and open the door. Another feature to be noted in many of their locks is a novel, strong and effective mechanism for reducing to a minimum the friction of latch bolts, and producing a smooth, uniform and easy action.

The most annoying and serious objection in many forms of latches has been that, in the operation of closing a door, the indirect and unmechanical action of the staple or striker against the beveled edge or nose of the latch, caused its flat face to bear directly against the lock case, producing such an amount of friction that the bolt would bind and refuse to move, so that to be sure of latching doors it has been necessary to slam them so violently as to shake loose knobs, hinges and other furniture, and often break even the latch itself. The improved and perfected anti-friction latch overcomes all these difficulties, has a smooth, noiseless action, and by an exceedingly simple, strong and durable mechanism causes the striking plate to act directly and without loss of power to force back the bolt, which, in its motion, is entirely withdrawn from contact with the lock case, so that the slightest motion imparted to the door causes it to latch surely, gently and noiselessly, and renders slamming alike difficult and unnecessary. Their locks also show several novel systems for rendering latch bolts reversible without impairing either the strength or durability of the mechanism.

The principal objections which have prevented reversible latches from coming into general use have been, it is claimed, that their combination of small coil and other springs with necessarily weak and delicate parts rendered them, exceedingly liable to break and difficult to repair; that in mechanisms free from these objections the bolts could be reversed by malicious persons or mischievous children after the latches had been fixed to their doors, and if left in this reversed condition, any attempt to close the door would be likely to derange or break the latch. The improved mechanism overcomes all these difficulties, and provides at moderate cost a latch which, before it has been placed upon the door, can be reversed at will by simply pulling out the head of the bolt and turning it half way around, but once fixed in position upon the door it becomes impossible to reverse, and it operates as an ordinary latch.

THE RUSSEL & ERWIN MANUFACTURING COMPANY AT THE PARIS EXHIBITION—ONE SIDE OF THE EXHIBIT.

Another feature of the exhibit is the numerous styles of improved and perfected steel keys for use with various kinds of door, cabinet and padlocks. The peculiarities of these new keys are that they possess an exceedingly light, portable and convenient shape, combined with strength, durability and tasteful design, and can be produced entirely by machinery at a great reduction in cost over the old system. They also exhibit a line of their simple, noiseless anti-friction pulleys and sheaves for use with sliding doors, windows, &c. The advantages of these are their simplified construction and arrangement, which enables their production by machinery at a greatly reduced cost. The whole exhibit is a credit to American ingenuity and manufactures, and well merits the praise that it constantly receives. Of its particular merits as a whole no better description can be given than the words of their claim: "The novelty and practical simplicity of our improved and perfected mechanisms; the advantages of the system of machine-made interchangeable parts; the accuracy and precision with which they are made and fitted; the artistic manner in which grace and beauty are combined in the ornamentation of objects of utility; and the scientific proportioning of parts to the strains to which they are subjected, for the purpose of obtaining the greatest amount of strength with the least expenditure of labor and material."

Prof. Blake, Commissioner from Connecticut, writes as follows to the Hartford *Courant* concerning this exhibit:

"This exhibit is one of the best conceived and most perfect, as regards installation, yet made at any of the great exhibitions. The case, in the form of a parallelogram upon the floor, occupies a space 25 feet by 12 feet, and presents four fronts, the two ends being recessed, so as to form at one end an office, and at the other a small show room, devoted to a display of the beautifully-finished edge tools for carpenters' and builders' use. This little room is extremely convenient for those who have especial examinations to make apart from the crowd in the passageways. The exhibit is remarkable as a comprehensive display of extremely diverse objects, embracing over 4000 distinct representative specimens of all classes and grades, from ordinary cast and wrought iron, up to the finest descriptions of artistic fittings in bronze, brass and enameled and gilded metals. These objects are chiefly door, cabinet and padlocks, handles, hinges, anti-fric-

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SEE PAGE 9.

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tion pulleys and sheaves, bolts, fire-irons, bell pulls and ornamental finger-plates for doors. Among the locks, we note especially certain forms specially adapted to the French style of trimming doors with long bolts made to throw twice with the key, a device which is certainly convenient when the carpentry is extremely rude. As a rule, the French doors are thinner than ours, and rim locks rather than mortise locks are used. This style of lock is commendable for its decorative capacity. It may be made ornamental, and in France usually is. From this point of view it is a mistake to hide a lock in a mortice. It should be made tributary to the decoration of the room, as most of the finer French locks are. Nothing but the utter want of artistic design and finish in our American rim locks has prevented, no doubt, some of our most advanced architects from insisting upon having locks of this construction instead of the ordinary mortise form. It is a pleasure to note that Messrs. Russell & Erwin have commenced to make decorative rim locks, and I hope that their efforts will meet with due appreciation. The French exhibits afford many useful suggestions, and show in a convincing way the decorative value of surface locks and bolts. The wood screws, which are shown in great variety, are mostly of special note for the perfection of finish of the thread the points, and the heads. They are shown in open packages and in a tastefully-executed panel of black velvet, on which the monogram of the company is executed with brass screws of different sizes.

"The *champ-lévé* enamels of this firm are particularly noteworthy, as successful applications of enamel to the decoration of door hinges and other trimmings. Space will not permit of a description of many of the novelties and improvements which may be found in this highly creditable exhibit, which has been liberally recognized and honored by gold and other medals."

Among the favorable notices of this exhibit of American hardware by the European press, we take the following extracts from *Martineau & Smith's Hardware Trade Circular*, Birmingham, and the *Continental Gazette*:

(Extract from *Martineau & Smith's Hardware Trade Circular*, Birmingham, of Sept. 30, 1878.)

One of the largest and most interesting hardware exhibits in the American section is that of the Russell & Erwin Manufacturing Company, of New Britain, Conn., U. S. A. Their reputation is more than sustained by the extent and variety of the display, embracing many novel and ingenious inventions of utility, and many *recherché* and artistic designs, while their combinations of the useful and the ornamental are really deserving of careful inspection—relating, as they do, to almost every branch of general hardware. Their *vitrines*, of rich black walnut, are prominently placed in one of the main aisles or alleys which run athwart the building on the Champ de Mars, and inclose, to the number of 4000, distinct representative specimens of articles, all of which are made by them or whose manufacture is controlled by the company. The *vitrines* consist of two large cases placed so as to include an office between them, closed in at the ends by large double doors, which are filled up with specialties of artistic merit, and practically illustrate the utility and convenience of their door furniture, latches and locks. This office is again divided into two—a large and a small one—a third showcase, set internally at right angles, containing a comprehensive display of woodworking tools of the Douglass Manufacturing Company, for which the Russell & Erwin Company are the sole agents.

The alcove which contains this *vitrine*, like the large bureau at the other end of the case, is tastefully upholstered in blue, the back of the cases, which are 25 feet long, forming the walls, which are draped with tapestry hangings. In the case next the aisle is arranged the builder ironmongery exhibit, consisting of locks, latches, drawer pulls, sash pulleys, door and drawer furniture, knobs, hinges, finger plates, &c., from the cheapest to the most artistic and expensive. I have before alluded to the immense number of different patterns of locks required for the American trade, and this case is another evidence of it, every imaginable size, shape and variety being illustrated in all grades. Some of the artistic fittings of the most elegant forms in bronze, nickel, gold and enamel for architectural decoration, arranged on blue velvet, show extremely well and attract a good deal of admiration.

In the center of the other case is the trademark of the company, composed of the wood screws made by them, arranged very ingeniously and skillfully on a black velvet ground, the number, brilliancy and color of the bronze, nickel and plated screws giving one the idea, when viewed from a short distance, of richly-wrought gold and silver embroidery. In this case are displayed more general descriptions of hardware, such as padlocks, Bolts, hinges, pulleys, sheaves, door bells, coat and hat pegs, hooks, fire irons, &c. In the office, which is tastefully fitted up with American furniture and draped with blue, are several models of doors with latches, locks and other appliances, to enable them to be more closely examined than those in the cases.

(From the *Continental Gazette*, Nov. 14, 1878.)

Among the most prominent successes of American manufacturers at the Exhibition, we are glad to notice the exceptional success obtained by the celebrated firm of Russell & Erwin for their exhibit of artistic bronze fittings and general American hardware. They achieved the unprecedented success of obtaining the five highest awards accorded to goods of this description in five different classes. * * * * One of the most flattering compliments paid by European connoisseurs to their goods is the fact that the whole of their collection, the most extensive at the Exhibition, has been sold at high prices to the most important museums of Europe, as curiosities of art metal works. Messrs. Russell & Erwin, we understand, offered some of their goods as a present to the Conservatoire des Arts et Mètiers and to the Museum of Decorative Art, but the goods being prohibited in France, the government would not permit the institution to accept them, even as a present. Out of the only three medals awarded to the United States for industrial art work, the Russell & Erwin Co. received the two highest.

The following is a memorandum of the prizes awarded:

At the Exposition Universelle, Paris, 1878, the Russell & Erwin Mfg. Co., of New Britain, Conn., U. S. A., obtained the five highest awards for their line of goods in five different classes, viz.:

A gold medal in Class No. 66—For fine secured door and padlocks, and artistic bronze fittings for architectural decoration.

A gold medal in Class No. 43, and honorable mention in Class No. 59—For general hardware, tools, &c.

A bronze medal in Class No. 25—For art castings.

A bronze medal in Class No. 11—For designs for the ornamentation of door, window and fire-place decoration.

In Classes No. 11, 25, 59 and 66, they received higher awards than any other firm in their line of business.

In Class No. 43 there are only three other exhibitors that received the same prize.

In Class No. 66 they received the only gold medal given for bronze goods or fine locks.

They are the only firm in the hardware line that received two gold medals, and out of only three awards to the United States exhibitors for art work, they received two.

Our notes of this exhibit were written by our Paris correspondent many months ago, but owing to unavoidable delay in obtaining the illustration which we present herewith, their publication has been delayed until now.

Train Accidents in 1878.

The *Railroad Gazette* publishes, in a recent issue, an elaborate report of the train accidents in 1878, comparing the number and kind with those of former years. While the figures are not claimed to embrace all accidents, as a complete record is not given by correspondence or in the daily press, they show the proportion of accidents by collision or derailment. The following gives a recapitulation of the accidents of the last six years:

	1878.	1877.	1876.	1875.	1874.	1873.
Collisions	250	268	279	278	260	332
Derailments	481	581	655	840	654	815
Other accidents	39	42	48	83	66	76
Total	740	891	982	1,201	980	1,283

It may be of interest to cite from the elaborate tables given by the *Railroad Gazette*, the following record of causes that lead to defects of road material and rolling stock:

DERAILMENTS.

	1878.	1877.	1876.	1875.	1874.	1873.
Broken rail	17	46	50	107	42	111
" axle	28	43	38	39	20	21
" wheel	5	12	22	33	20	26
" bridge or trestle	21	21	20	26	33	1
" truck	13	8	10	15	8	
" or defect. switch	1	6	4	15	12	
" or defective j'nt	2	2	1	10	5	
" or defective frog	2	2	3	8	8	

ACCIDENTS WITH COLLISION OR DERAILMENT.

Boiler and cylinder explosions	12	15	22	29	13	19
Broken parallel or connect. rod	11	13	7	14	8	11
Broken axle	..	1	2	13	..	..
" tire	..	1	..	9	..	..
" crank pin	..	1	..	2	..	..

Attention is called to the fact that the number of accidents due to the breakage of rails has very strikingly decreased. The *Railroad Gazette* ably sums up the points involved in the following manner: These vary very much with the coldness of the winters, but 1877, as well as 1878, had a mild winter, and the decrease from 46 to 17 indicates that quality of rails and condition of road bed has had something to do with it; the change since the cold wiuter of 1875, when we recorded 107 derailments by broken rails, or from that of 1873, when there were 111, is certainly remarkable. It is to be hoped, and there are reasons for believing, that much of this improvement has been due to permanent causes. The cold weather which we have been having this winter will enable us to judge better of this. A few very cold days in December seem not to have had the effect that was almost sure to follow a few years ago, as we had but one accident from a broken rail to report that month. But heretofore, as we have noted from year to year, most of the accidents from this cause have been in the winter months, and they have been especially frequent in cold winters, as appears below:

Accidents from Broken Rails in First and Third Quarters of the Calender Year, for Six Years.

	'73.	'74.	'75.	'76.	'77.	'78.	Total.
First quarter	65	20	90	26	26	7	234
Third quarter	5	3	3	5	7	2	27

That is, in the quarter including the months of January, February and March, there have been in the different years from three to thirty times as many accidents from broken rails as in the quarter including July, August and September; and in the aggregate for the six years there have been about nine times as many in the hot quarter. Breakages of wheels seem to have followed pretty closely the breakages of rails; that is, there have been more in cold than in mild years, but this is not true of breakages of axles. There were more of these in the mild year 1877 than in the cold one 1875. Generally, it would appear that the breakages of rails in cold weather are due chiefly to an inflexible, uneven road-bed, rather than to (if at all to) any change in the tenacity of the rail.

A correspondent writing to the Pittsburgh *Sunday Leader* from Leetonia, Ohio, says: Mr. Perry Byard, of this place, recently patented a self-lubricating car-wheel. One of them was put on a car for trial at the Cherry Valley Iron Company's coal bank here about two weeks ago, and run one week without oiling, except at the time it was put on the car. The wheel is so constructed that the hub can be removed when worn out and replaced with a new one at a trifling cost, thereby saving the expense of a new wheel entire.

Iron.

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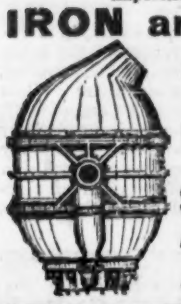
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The Electric Light.

(Concluded.)

A new lamp, the invention of Rapieff, a Russian, is now undergoing examination in London, and is stated to be so much under control that it can be turned all the way up and down the scale between the power of five gas burners and that of 200. The voltaic arc is produced in this lamp between four carbon rods, arranged in pairs, each pair forming the letter V. The apices of the Vs meet in a common center. A regulator is attached, which maintains the carbons at an invariable distance, and results in a light as regular as that of any other similar lamp. It is claimed that one of the carbons of this patent can be removed and replaced without interrupting the current, which is a new feature.

Recent issues of the English technical journals report very confidently and enthusiastically upon the Werdermann lamp, which, it is claimed, has the advantage of permitting the production of a large number of lights of low power. In place of the electrodes of similar form and dimensions ordinarily used in electric lamps, Mr. Werdermann makes one large bun-shaped disk of carbon, placed with the rounded face downward. The other carbon is a fine rod only .12 to .16 of an inch in diameter, the upper end of which is pointed and maintained in contact with the center of the lower surface of the disk. This rod is supported by means of a spring collar, which also forms the circuit connection. It is within about .75 inch of the top of the carbon rod, so that the .75 inch becomes incandescent, and the contact between the two carbons being only a point, a small electric arc is produced between them, while the electricity is at the same time passed on through the carbon disk, and the connections there attached to the next lamp.

The second large class of lamps, that in which the light is produced by incandescence, had recently attracted a full share of attention, as it has been understood from Mr. Edison's guarded statements that it is in this direction that he has been working. This notion is as old as 1845. An electric lamp was invented on this principle in that year by an American by the name of King, who took out a patent for a light based on the use of a burner of the most infusible metals or of a continuous carbon, heated to brilliant whiteness by the passage of the electric current. The light was produced in a glass tube in which a vacuum had previously been created, the object of this being to prevent the combustion of the carbon or metal by the oxygen of the air. King took his idea to England and patented it there. It was improved by Greener and Staite the following year. It is worthy of notice that King's lamp created an agitation among the holders of gas stocks from 1845 to 1849, equal in every respect to that produced in 1878 by Mr. Edison's announcement. The agitation extended to the United States, where the "alarming topic" was much discussed by the gas companies, and where "this unfortunate discovery," as they called it, was regarded as the death-blow to illumination with gas. The alarm passsed away, however, in a few years. The magneto-electric machines of that day were of small power, and the electrical science was generallly in an imperfect state. King's light was almost as costly as gas and much more troublesome, and could not be produced at an indefinite number of burners by the passage of a single current. So impracticable was King's idea that after 1850 lighting by incandescence fell into oblivion. The subject was taken up again in 1857 by a Frenchman, but not seriously until 1873, when Lodyguine, a Russian, invented a new lamp, which has since been improved by Konn and Bouliguine, and has been used in a merchant's warehouse at Stt Petersburg for some time with excellen. results. The principle of this lamp is the incandescence of a very small bar of car bon in a sealed glass tube, from which the oxygen has first been expelled.

It is claimed that the light from incandescent bodies is softer and steadier than that from the voltaic arc. Sawyer has been working in the same direction. The light is produced by the incandescence of a tiny perpendicular bar of carbon, 1 inch long and 1-10th inch in diameter, which is sustained in place by two large thick bars, arranged one above the other horizontally. The current, in passing from one large carbon bar to the other, through the small one, encounters great resistance. It heats the small bar to whiteness, and produces a light of the most admirable character. It is white, mellow and pleasing to the eye, and floods a room with a radiance resembling that of daylight. The blaze in the Sawyer lamp can be turned up and down just like a gas-light. In order to prevent the combustion of the carbon, which would be almost instantaneous in the open air, the lamp is inclosed in a sealed glass tube, 2 inches in diameter and 6 or 8 high, from which the atmospheric air has been expelled, and into which nitrogen or some similar gas has been introduced. Mr. Sawyer refuses to state at present exactly what the composition of this gas is. He claims simply that it will preserve the carbon from combustion for an indefinite length of time.

Edison's light, it is now known, must also be classified under the head of candles based upon incandescence, the material used, an alloy of platinum and iridium, being used on account of its infusibility. Although the details are still a secret, it is stated that the conductor is not an ordinary coil, but a peculiar arrangement of the metal, whereby, in accordance with a new discovery of his in connection with radiant energy, a much weaker current is made to generate a given light than if a single spiral were used. By slight modifications in the shape of the conductor, he has obtained from one cell of a Daniel battery a light strong enough to read by. A simple adjustable apparatus attached to each lamp, regulates the amount of electricity it shall draw from the main current, and makes it entirely independent of any changes in the strength of the current, as well as of all other lamps in the circuit. That portion of the current which is used for the regulator, is also made to serve in the production of the light. A part of Mr. Edison's device for compensating for loss in subdivision, consists apparently in the utilization, for illuminating purposes, of the resistance of the regulator, and of all other resistance outside of the main conductor, and part in the peculiar form of the conductor.

As we have already pointed out, the application of the electric light for domestic purposes is still a problem unsettled; but it would be idle to deny that the progress made within the past year has been such that, in view of the talent and energy employed in its solution, there is a fair promise of the realization of this great improvement in the near future.

The light from carbon regulators, with all its brilliancy, has the disadvantage of being unsteady and flickering, and of casting, when bare, deep shadows. In order to obviate this, the light is inclosed in glasses which, however, absorb much of it. Thus, the best experiments have taught that plain glass absorbs 10 per cent.; ground glass, 30 per cent., and opal glass, that generally used, 60 per cent. The unsteadiness of the carbon lights is greatly due to non-uniformity of the retort carbon employed, so that there is room for improvement in this direction. It has been found convenient, in many cases, to subdue and diffuse the light by opalesque globes, notwithstanding the loss of light they entail. It is stated that while, on the other hand, the lights produced by incandescence are steadier and more diffused, the electric resistance is much greater.

The first application of the electric light for purposes beyond the laboratory experiment, was at the La Heve light-house, near Havre, France, where, in 1863, an Alliance machine was put up. The results were highly favorable, and the electric light would undoubtedly have rapidly replaced the oil lamps, had it not been for the considerable increase of cost and the fear of sudden interruptions by accidents. Now that these drawbacks are rapidly being overcome, there can be no doubt of a more universal introduction, the first steps having been taken in France, England, Austria, Russia, Sweden and Egypt. Experiments have shown that the electric light can be seen at least five miles further than the oil light, and that in foggy weather the range of the former is twice as great as that of the latter. Its use has also been suggested, and to a certain extent adopted, for guarding against the disaster of collision of vessels, by the French, English and Russian navies. In the merchant marine, the Compagnie Générale Transatlantique, the French line of ocean steamers, have led the way in making experiments on the unfortunate steamer Amérique, which we learn have proved highly successful.

A great advantage of the electric light is, that it does not vitiate and heat the air of rooms and halls beyond a trifling extent when compared with gas, and that its whiteness preserves the tints of colors. It is, therefore, finding a growing range of utility in workshops, mines and factories, especially in places where large high halls are to be well lit up. It has been advantageously employed in many industrial establisements, in railroad work, harvesting, for loading and unloading cargoes, mounting machinery, carpentry, weaving, dyeing and similar trades. In such cases, however, it is generally necessary to empoly two machines, in order that the light of the one should counteract the shadows thrown by the other. For public squares it is well known it has met with much popularity, but it still remains a question to be settled by experience whether it can be used, with present appliances of electric lighting, for the illumination of streets. It is now in operation in 14 different places in Paris, in London, Brussels, Madrid, and St. Petersburg for large squares. For theaters, the safety against fire will do much to assure the audience and prevent the recurrence of panics, while the increased brilliancy of the illumination will add to the attractions of the stage. The electric light, however, possesses the most immediate value for large industrial establishments, and, save in lighthouses, it is there that we find it most rapidly extending, because, as a rule, the necessary motive power for the machines is at disposal, and the first cost is lessened, while the current expense is naturally smaller by reason of its claiming but a portion of the amount of power generated, which, therefore, as it were, is furnished to the lighting apparatus at the wholesale price. The benefit derived from the new light naturally depends upon the nature of the work to be done; it may, in some cases, virtually double the capacity of a mill where distinctions of color claim superior illumination, while in other cases it will only facilitate operations, and permit more rapid manipulation on the part of the workmen. The electric light will prove a valuable aid when a press of work calls for double turn, and will, undoubtedly, in the future, when many small deficiencies of detail are overcome, universally become the substitute for gas, as it has already done, in some instances, during the last two years under special conditions. For large areas, the electric light will quickly occupy a domain which gas has never filled, and may soon succeed in ranking with it in the lighting of main thoroughfares, but it does not appear that, in its present state, it can replace petroleum or gas in the illumination of private houses.

As for the cost, it will be comparatively an easy matter to determine the first outlay for plant, apparatus and necessaries, by obtaining estimates from manufacturers. It is on the score of running expenses, repairs and life of apparatus that the experience gained is meager. The most important item in the working expenses is, no doubt, the motor power, and this may be reduced to that of the cost per horse power of the engine employed—a matter which must vary immensely, both with the nature of the engine, and with the circumstances of the locality and extent of the supply required. The most convenient form in which, therefore, to give any general answer as to the cost on this head, would seem to be a proportion between the horse power employed and the amount of light produced, the value per horse power being made to vary with the particular circumstances of each case.

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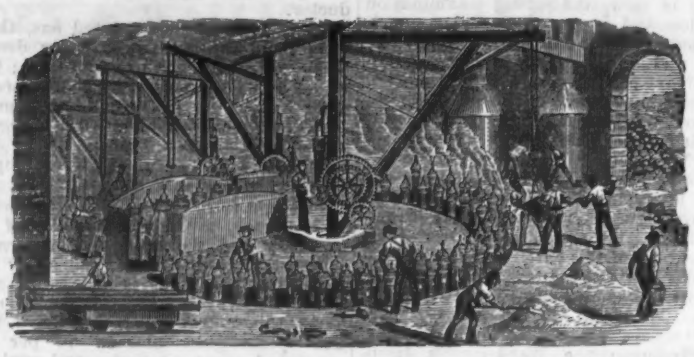

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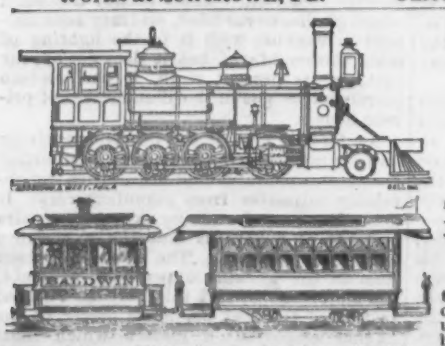

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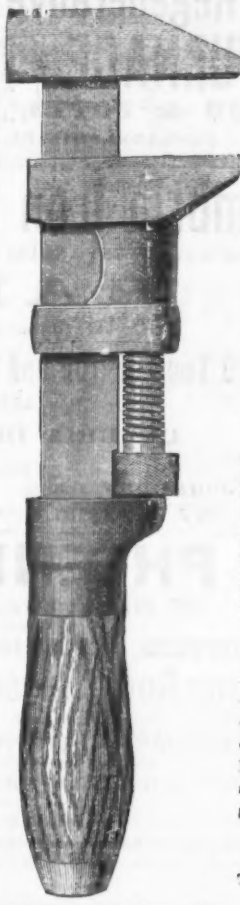

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viz., that extreme regularity of movement, not merely during one revolution, but also during successive revolutions, is one pre-eminent requirement.

A rough estimate, which the designers of electric machines give, of one indicated horse-power per light of about 1000 standard candles, may hold good where the number of lights from one machine is considerable; but where this is not the case, or where single lights only are concerned, a higher proportion of motive power should be taken. Of course, this does not include the reserve of power required to meet the sudden and severe strains to which the motor engine is subjected by the electric machine.

In many parts of France, such as in and around Paris, at Rouen, and in the neighborhood, electric lighting has been applied regularly during the last two years to many manufactories. Among others, to iron works, to spinning mills, to weaving sheds, &c., and to railway goods yards, and other large areas of a similar description, the illumination being almost always from a series of Gramme machines, each producing only one light, or else from one Lontin machine, supplying a considerable number of lamps. It is understood that at several of these localities, the result is stated as "three times the amount of light at one-fifth the cost, as compared with the previous illumination by gas." It must, however, be borne in mind that gas in France costs only two-thirds of what it does in America, and that in almost all the above cases a large amount of steam power existed on the premises, and that probably the small amount required to keep up the electric illumination, was thought so insignificant as not to be worth considering as a separate item.

The only reliable published data on the cost of electric lighting which has come to our notice dealing which conditions in America, is the report on the lighting of the Hall of Representatives by the Brush machine, submitted by Robert Briggs, C. E., of Philadelphia. Hitherto the hall was lit up with 1228 burners, using 4½ cubic feet of gas per hour, making a total consumption per hour of 5500 cubic feet of gas. Based upon experiments made at the Pennsylvania depot at Philadelphia, Mr. Briggs estimates that 12 Brush lamps will furnish a quantity of light fully equal to that of the gas. The power required being 42-horse power, his estimate of cost was:

42-horse power at 13½ cents per horse power for 3 hours' average each day	$5.60
One engineer	5.00
Two assistants	2.50
Carbons	1.35
Twenty per cent. of cost of apparatus ($12,000) 313 days	7.65
Total	$24.60

To offset this, there are 16,500 cubic feet of gas burned in three hours each day, at $3 per meter, equal to $49.50. This shows that with the most liberal estimate for deterioration (10 years for whole renewal) and repairs, electric lighting of the hall may be taken as one-half as expensive as gas lighting.

To conclude. It will be noticed that much has been accomplished in electric lighting, and that there is a fair promise that much more will be arrrived at by the large number of earnest, energetic and ingenious investigators and experimenters, who are now endeavoring to enlarge the field of utility, which, it must be conceded, the electric light has already occupied. As is usual in times of intense public excitement, many sanguine statements have been presented, so the expectation has run high and has not escaped without disappointment. Now that a clearer insight into the subject may be obtained, we find the electric light occupying ground hitherto but insufficiently covered, and it would seem that the best efforts of those devoted to the subject ought to be primarily directed to an elaboration of detail which will make electric illumination reliable and reduce its cost. How rapidly its use will extend, and to what purposes it may ultimately be advantageously applied, is still a matter of conjecture; but inventive talent, urged on by the great interests at stake, will not, we trust, allow it to remain so long.

How to Color and Finish Brass Goods.

To prevent the every-day tarnishing of brass goods, the trade has long resorted to means for protecting the surface from the action of the atmosphere, the first plan of which is to force a change to take place. Thus, if brass is left in damp sand, it acquires a beautiful brown color, which, when polished with a dry brush, remains permanent and requires no cleaning. It is also possible to impart a green and light coating of verdigris on the surface of the brass by means of dilute acids, allowed to dry spontaneously. The antique appearance thus given is very pleasing, and more or less permanent. But it is not always possible to wait for goods so long as such processes require, and hence more speedy methods became necessary, many of which had to be further protected by a coating of varnish. Before bronzing, however, all the requisite fitting is finished, and the brass annealed, pickled in old or dilute nitric acid till the scales can be removed from the surface, scoured with sand and water, and dried. Bronzing is then performed according to the color desired; for although the word means a brown color, being taken from the Italian "*bronzino*," signifying burnt down, yet in commercial language it includes all colors.

Browns of all shades are obtained by immersion in solutions of nitrate or the perchloride of iron, the strength of the solutions determining the depth of color. Violets are produced by dipping in a solution of chloride of antimony, or of perchloride of iron. Chocolate is obtained by burning on the surface of the brass moist red oxide of iron, and polishing with a very small quantity of black lead. Olive green results from making the surface black by means of a solution of iron and arsenic in muriatic acid, polishing with a black-lead brush, and coating it, when warm, with a lacquer composed of one part lac-varnish, four of turmeric, and one of gamboge. A steel-gray color is deposited on brass from a dilute boiling solution of chloride of arsenic; and a blue by careful treatment with strong hydrosulphite of soda. Black is much used for optical brass-work and is obtained by coating the brass with a solution of platinum, or with chloride of gold mixed with nitrate of tin. The Japanese bronze their brass by boiling it in a solution of sulphate of copper, alum and verdigris.

Success in the art of bronzing greatly depends on circumstances, such as the temperature of the alloy or of the solution, the proportions of the metals used in forming the alloy, and the quality of the materials The moment at which to withdraw the goods, the drying of them, and a hundred little items of care and manipulation, require attention which experience alone can impart.

To avoid giving any artificial color to brass, and yet to preserve it from becoming tarnished, it is usual to cover properly cleaned brass with a varnish called "lacquer." To prepare the brass for this, the goods, after being annealed, pickled, scoured and washed, are either dipped for an instant in pure commercial nitric acid, washed in clean water and dried in sawdust, or immersed in a mixture of one part of nitric acid with four of water, till a white curd covers the surface, at which moment the goods are withdrawn, washed in clean water and dried in sawdust. In the first case, the brass will be bright; in the latter, a dead flat, which is usually relieved by burnishing the prominent parts. Then the goods are dipped for an instant in commercial nitric acid, and well washed in water containing some argol (to preserve the color till lacquered), and dried in warm sawdust. So prepared, the goods are conveyed to the lacquer room, where they are heated on a hot plate and varnished.

The varnish used is one of spirit, consisting, in its simple form, of one ounce of shellac dissolved in one pint (imperial) of methylated spirits of wine. To this simple varnish are added such coloring substances as red sanders, dragon's blood and annatto, for imparting richness of color. To lower the tone of color, turmeric, gamboge, saffron, Cape aloes and sandarac are used. The first group reddens, the second yellows the varnish, while the mixture of the two gives a pleasing orange.

A good pale lacquer consists of three parts of Cape aloes and one of turmeric to one of simple lac-varnish. A full yellow contains four of turmeric and one of annatto to one of lac-varnish. A gold lacquer, four of dragon's blood and one of turmeric to one of lac-varnish. A red, thirty-two parts of annatto and eight of dragon's blood to one of lac-varnish.

Lacquers suffer a chemical change by heat and light, and must, therefore, be kept in a cool place and in dark vessels. The pans in use are either of glass or earthenware, and the brushes of camel's hair, with no metal fittings.

Untaxed Imports into Mexico.

We understand that the following articles are admitted into Mexico duty free:

Arms for the National Guard of the States, whenever required by the government of the Republic of Mexico, with the consent of the government and legislature respectively; telegraph wire, iron and steel wire for carding, No. 26 and upward; alabaster, crude fish oil, steel in bars for miners, spars and anchors for large and small vessels, plows and plow-shears for agriculture, oats in grain or in straw, quicksilver, pumps for engines, and common pumps of all kinds for irrigation and other uses; machetes, scythes, hose, sledges, rakes, shovels, spades, pick-axes for agriculture, hydraulic lime-water pipes of all kinds and dimensions, card wire in bales for machinery, hand carts, wheel-barrows and donkey wagons, crucibles, all sorts and sizes; steam cars and wagons, coal of all kinds, mineralogical and geological collections, all branches of natural history, frame houses and iron houses complete, designs and models of machinery, edifices, monuments and vessels, heads and staves for barrels, vessels of all kinds built for sale or naturalization, or introduced for navigation in lakes, bays, canals and rivers of the republic; steel and iron wrought for railroads, fruits and vegetables, fresh, except those specified; guano, ice, corn meal, scientific instruments, books, except those otherwise specified in the tariff; wood, bricks and material for their manufacture; printing materials, building wood and staves for vessels, corn, maps, globes and charts of all kinds; machinery, steam machines, locomotives and everthing pertaining to railroads, marble in blocks or in squares, all sizes for flooring, box wood, cabinets of ancient or modern coins, precious metals in ingots or dust, molds and patterns for the arts, fuses for mining purposes, legal money, silver or gold, of all nations; objects of natural history or cabinets, seed and plants to improve agriculture, hay and grass, slates for roofs and floors, lithographic stones, mining and blasting powder, vaccine virus, oars for boats, common salt imported by way of Paso del Norte, saltpeter, blue stone, wooden types and other utensils for lithography, printing ink, silversmiths' anvils, rags, all kinds for making paper; blacksmiths' anvils.

The seventeenth article of the Mexican tariff requires that all articles, including those that are duty free, shall be entered regularly on the ship's manifest, and have the private invoices, with a statement of their values and the parties to whom they are consigned.

The Kittredge Cornice and Ornament Works.—In a recent issue we mentioned the purchase, at the advertised sale, of the shops, tools, &c., of the Kittredge Cornice and Ornament Company by Hon. J. T. Brooks, one of the stockholders in the old company, and a resident of Salem, O. Since that date we learn that a lease of the property has been made to a firm known as Thompson & Blackwell, who are now in active preparation for the business of the new year. Mr. Thompson is of the firm of Thompson, Bayle & Co., who operated the works the latter part of last year, and has been connected with the concern in one capacity and another for several years. Mr. Blackwell is from Pittsburgh, is a man of means, and is quite favorably known. The new firm have purchased the small tools of the concern, the stock of stamped ornaments on hand and raw materials. It commences the business under very favorable auspices, and undoubtedly will achieve success.

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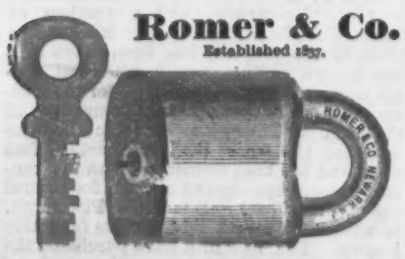

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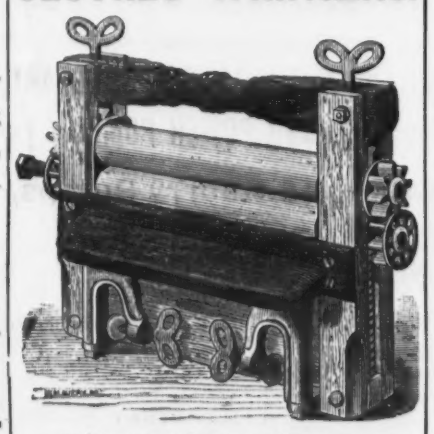

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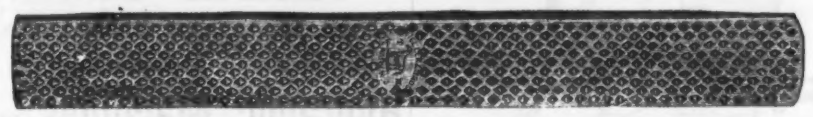

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Wilkinson's well-known goods, and the list and numbers are the same, while the discount to the trade is, we are informed, greater than on Wilkinson's. Alfred Field & Co., No. 93 Chambers street, are sole agents in this country for these goods.

Combination Power Press.

Power presses for striking blanks from sheet-metal, and making them into various necessary and useful forms, have become an indispensable feature in all classes of sheet-metal work. Many improvements have been made in the capacity and variety of manipulations in these presses, until, at the present time, they are so thorough in their usefulness that work is cut, raised, embossed, stamped and delivered at one operation.

The presses manufactured by W. J. Gordon, No. 235 Bread street, Philadelphia, are representative of this improved class, and are capable of varied adjustments to suit the different thicknesses of materiah kind of work to be done, &c. The press is simple in construction, and is, therefore, claimed to need little or no repair under fair usage. The cutter is fast to the slide, driven by cams on the driving-shaft. It has an adjustment by which it can be fed down as it wears, and adapted to any thickness of metal. After cutting, the work is held down until the arrival of the central plunger, which forces the blank through the die-seat and raises the edge. This central plunger, carrying the upper die, is driven by an eccentric on the driving-shaft. From this same eccentric strap another rod gives

a rocking motion to the lower die, so that at precisely the right moment it shall be vertical, to receive the impression from the upper die, and then fall back to a slanting position to allow the lid, bottom or whatever may be the work running through, to fall into the receiving box. The dies are changed with facility and in a few moments. There is a feed attachment, by which the operator is enabled to gauge and pass the work through quickly and with certainty, avoiding loss of time and waste of material. The upward motion of the slide is derived from two coiled springs above the frame; hence if the dies, &c., get out of line, the operator will be warned by the action of the springs in time to prevent improper or undue wear. All the dies and wearing parts are made of steel to insure durability, and the machine is made strong, but not too bulky or heavy.

Owing to the large and continued demand for a cheap supply of cans for lard, lye, paint, fruit, spice, oysters, &c., these presses have become a necessity in almost every tin and sheet metal shop in the country, on account of the accuracy of the work done by them and the speed with which it is accomplished. Sixty to 80 lids or bottoms can be cut, raised, embossed, stamped and delivered through the dies, as before mentioned, in one minute.

The presses are equally applicable to the largest or smallest class of work. The largest size press will strike a 20-inch blank and lay down the edge a depth of 4 inches. The other sizes are in proportion, and made to suit the requirements of the trade.

The Tariff of the Argentine Republic.

—Some changes are in contemplation in the customs tariff of the Argentine Republic which will interest those of our readers who are opening an export trade with that country. Among the changes proposed are the following: Agricultural machinery, iron wire and steam engines, over 10 horse-power, to pay an import duty of 6 per cent.: steam machines under 10 horse-power, 16 per cent.; fire-arms, 51 per cent.; any other kind of arms, bronze and art castings, 41 per cent.; saddlery, 36 per cent. All articles, of whatever description, if not otherwise classified in the tariff, are to pay an import duty of 26 per cent. The exports of the principal articles of produce in the country, such as wool, hides, &c., are also to pay a duty of 7 per cent.

Brown, Bonnell & Co.'s Affairs.

For some time it has been known to those well informed that there were dissensions in the firm of Brown, Bonnell & Co., of Youngstown, O. We do not consider the private affairs of an establishment a fit subject for newspaper discussion, but as the matter has now become public property by having been carried before the courts, we give in the following the main facts, such as we have been able to gather them from the local press and the published proceedings:

The difference between the stockholders arose out of the starting of the new Chicago house of Hale, Cleveland & Bonnell. Brown, Bonnell & Co. had made a contract, it seems, with this house to give it the exclusive right to sell the product of the mills in Chicago, and John B. Ayer's Sons, whose ruling spirit is Herbert Ayer, objected to this arrangement, as they were running a commission house and desired some of the product of the mill. The Ayers at once set themselves at work to defeat the workings of the contract, and Mr. Herbert Ayer, with Joseph H. Brown, bought the stock of Richard Brown and most of that of Thomas Brown. Very recently Joseph H. Brown sold his interest to the Ayers. The Ayers thus supposed themselves to have a controlling interest in the company. A meeting of directors was held several months ago, in which the contract with the new Chicago house was not only annulled, but a resolution was adopted making the house of John B. Ayer's Sons the Chicago agents for the sale of the iron of the Youngstown mill. It ought to be stated that the Chicago house of Hale, Cleveland & Bonnell was only started after John B. Ayer's Sons had informed Brown, Bonnell & Co. that they could get all the iron they wanted from the Brown mill at Chicago, and would not handle any of theirs. Brown, Bonnell & Co. felt the necessity of having a Chicago house to handle their iron, and the house of Hale, Cleveland & Bonnell was started, as before stated.

A meeting of the stockholders was to be held on the 22d inst., but on the 20th Judge Spear granted the following restraining order:

"By consent, all the parties to this action are hereby enjoined from holding any election for officers of Brown, Bonnell & Co., and transferring, or attempting to transfer, any stock of said Brown, Bonnell & Co. until the 22d of June, 1879, at 10 a. m., unless this order is sooner modified or changed."

In the petition asking for this injunction the allegation is made that a note, given by J. H. Brown to Samuel Hale, of Chicago, on which the stock, of the nominal value of $125,000, is held as collateral, is much less in amount than the value of the stock; that the stock was given as collateral with the express understanding that it was not to be voted by the holders, and Brown was to receive all the dividends which he has received; it is also alleged that the stock was fraudulently transferred on January 15, 1879, to Hale, and that on January 20, 1879, the money was tendered to pay the note, but it was refused, notwithstanding an agreement was made at the time the note was given that the stock should be given up as soon as the money was tendered in payment of the note.

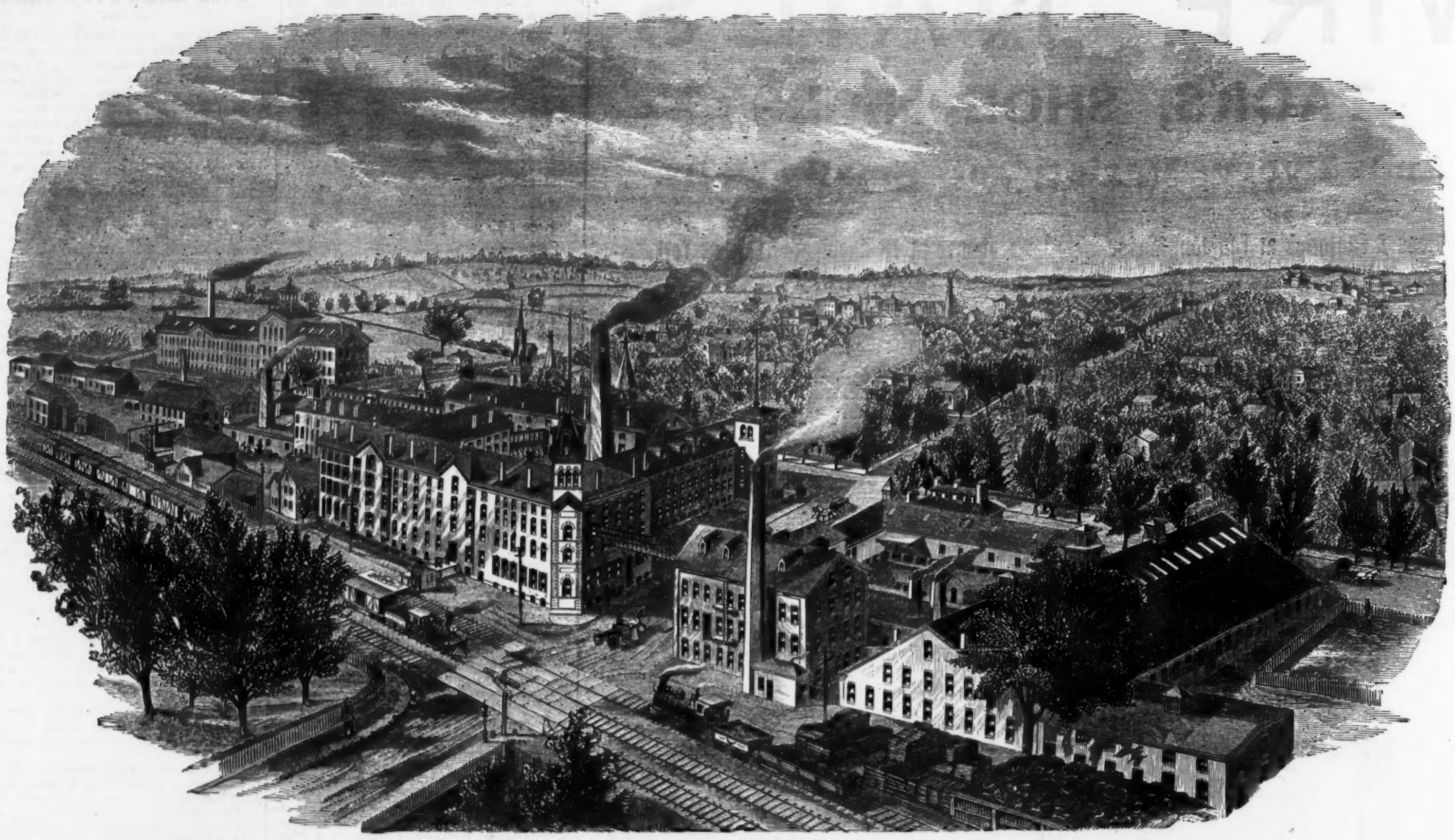
The counter petition of the defendants was quite lengthy, but in general denied all the material statements made by the plaintiff as to any attempt to get a fraudulent hold of the stock and vote it. It admits that Mr. Hale came into possession of the stock as collaterel security for the note, and the claim is set up that Samuel Hale has the right to vote this stock. The answer denies that there was fraud in the transfer of the stock to Hale, and alleges that the plaintiffs are endeavoring to obtain control of the mill to to their own individual advantage and to the injury of defendants. Notwithstanding this order a meeting was held, 4086 out of 15,000 shares being voted. This election resulted in the choice of the following gentlemen for the ensuing year: George W. Hale, George M. Ayer, Herbert C. Ayer, H. O. Bonnell, W. S. Bonnell, Peter M. Hitchcock and James L. Bottsford. This election was held on the advice of attorneys that it would not be in contempt of the restraining order of court. It is a Bonnell board throughout with the exception of Herbert C. Ayer. Proceedings were at once instituted against George W. Hale and H. O. Bonnell for contempt of court. Mr. Hale has been adjudged guilty of contempt by the court, and ordered to purge himself by resigning his directorship. Mr. H. O. Bonnell, on the other hand, has been adjudged not guilty, so at present the victory is with the Youngstown parties.

Electricity for Transmitting Power.—In the course of a lecture on electricity delivered by Mr. Gerard Finch, M. A., in connection with the Wigan Mining and Mechanical School, recently, a novel illustration was given of electricity performing mechanical work. A saw-bench was placed on a platform connected with a Siemens dynamo-electric machine, which, in its turn, was connected by wires with the machine outside the hall used for producing the electric light during the lecture. On the electricity being communicated the saw was set in motion, and timber up to 5 inches in thickness was cut into strips. It is proposed to test the practicability of working coal-cutting machines and other underground machinery by electricity.

RUSSELL & ERWIN MANUFACTURING COMPANY,

New Britain, Conn., U. S. A.

WAREHOUSES: NEW YORK, 45 & 47 Chambers Street; PHILADELPHIA, 425 Market Street; BALTIMORE, 17 South Charles Street.



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WOOD SCREWS, Iron, Brass, Nickel Plated, &c.

AWARDED

AT THE

Exposition Universelle,

Paris, 1878.

TWO GOLD MEDALS,
TWO BRONZE MEDALS and
HONORABLE MENTION.

The Bisschop Gas Motor.

The steady and constantly increasing demand all over the country for engines of small power, convenient and simple in construction, and easily managed by any one who can take care of ordinary machinery, has become so large that everything upon the subject of such engines or motors is of exceptional interest. There is no apology necessary, therefore, in presenting to our readers an illustration of the Bisschop gas engine or motor. Although, at the present time, the cost of gas in this country is very high, yet we hope the day is not far distant when gas will become a cheap commodity, and can be freely used in all our larger towns and villages.

Since human discovery began there have invariably been three stages in the development of all inventions of any importance. The first may be called the Utopic, or visionary; the second, the progressive, and the third, the practical phase. In the first stage a bold innovator dares to challenge the scientific prejudices of the thinking and the accepted traditions of the unthinking world, and pays dearly for his hardihood. If his name be Galileo, he escapes the stake only by a recantation of his heresies; if he be called Salomon de Cause, he is locked up in a madhouse as a dangerous enemy to society; if he be a Stevenson, he is decried by the scientists of his day and scoffed at by the public at large. The penalty for his temerity may vary according to the degree of civilization of the period in which he happens to live, but some penalty there always has been, and, we fear it is safe to add, there always will be.

THE BISSCHOP GAS MOTOR.

In the second period, some of the more advanced thinkers, having overcome their prejudices, push on in the line of investigation traced by the original discoverer, who by this time has long been forgotten. The invention is completed and developed, and progresses rapidly until it enters the third phase, the distinguishing feature of which is the utter impossibility of finding any one who had not predicted final success for the discovery from its very inception.

Gas motors seem to have reached the second stage of development, and are beginning to attract considerable attention from inventors and men of science. By referring to the accompanying engraving, the general construction and operation of the Bisschop engine will be readily understood. Its two prime qualities are compactness and simplicity. It consists of a vertical cast-iron cylinder, provided with radial projecting webs, whose surfaces represent about five times the area of the exterior surface of the cylinder. The object of these surfaces is to carry off the heat by radiation, and thus dispense with the necessity of employing water to cool the cylinder. The Bisschop gas motor is single acting. Gas passes into the valve-chest through the shorter of the tubes shown in our illustration, and thence is admitted to the cylinder below the piston, where it is exploded, producing the upward stroke. The down stroke is caused by atmospheric pressure. A rubber pouch on this line of pipe serves to prevent any irregularity in the gas pressure from influencing the regularity of the action of the engine. The second pipe shown conducts gas to two small jets, one of which is placed vertically over the other. The upper of these jets is placed in or excluded from communication with the gas in the cylinder by a vertical slide-valve, and produces the explosion. The object of the lower jet is to relight the upper one when it is extinguished by the force of the explosion. An air cushion is formed between the explosive mixture and the piston, and this is heated and compressed during the explosion, and immediately expands and cools after it. The other parts of the engine explain themselves. Neither the piston nor the slide-valve requires lubrication.

The Bisschop gas motor is constructed in three sizes by Messrs. Mignon & Rouart, of Paris. The smallest size is capable of producing about 1200 foot pounds per minute, or the 30th of a horse-power, and may be rated at one-half man power. The next size produces nearly one-tenth of a horse-power, or 2700 foot pounds per minute, and is equivalent to a little more than the power of an able-bodied man working continuously. The larger size would be rated in this country as one third of a horse-power, which is considerably more than a man can produce. These engines are quite light and easily portable. If they are used with the bed plate, they can be set upon the floor. If they are used without the bed plate, they require to be bolted to the floor, but in neither case is any foundation whatever necessary.

The motors of 15 foot pounds consume about 11.6 cubic feet of gas per hour at a normal speed of 100 revolutions, and their cost is $100. The large motors (180 foot pounds) consume 26.4 cubic feet of gas at 60 revolutions, and cost $180. These engines were exhibited at the Paris Exposition, where they attracted considerable attention. Their action is very smooth and regular, and is free from the excessive noise which has attended the working of most of the gas engines constructed up to the present. We are told that on one occasion a Bisschop motor ran 47 days and 47 nights without stopping, and without requiring any attendance. Be this as it may, this engine is certainly a stride toward the solution of the problem of gas motors.

Death of an English Ironmaster.

One of England's self-made men, Charles Cammell, ironmaster, of Norton Hall, near Sheffield, died in London recently, in the 70th year of his age. He was born in Hull, where he was apprenticed to an ironmonger. Having served his time, he went to Sheffield, accepting an engagement as traveler for Messrs. Ibbotson, Globe Works, which establishment he left in 1837, and with Mr. Thomas and Mr. Henry Johnson, formed the partnership of Messrs. Johnson, Cammell & Co., as steel and file manufacturers, in Furnival street. The success of their operations justified them, in 1845, in taking two acres of ground in Saville street East, on which were founded the now world-famous Cyclops Steel and Iron Works. The partnership continued till 1852, when Mr. Thomas Johnson died, and then Mr. Bury was taken in as a partner, and on that gentleman retiring, in 1855, the firm became Chas. Cammell & Co. In 1864 the Cyclops Works were converted into a limited liability company, capital £1,000,000, Mr. Cammell being chairman. The Cyclops Works, as they exist to-day, include two other works which formerly adjoined them (the Howard and Angenoria Works); the plant includes 50 puddling furnaces, nine mills, four 4-ton Bessemer converters and eight Siemens-Martin furnaces. In 1865 the company purchased the Yorkshire Iron and Steel Co.'s works, at Pemstone, where they have two 5-ton and two 7-ton Bessemer converters. These works stand on 25 acres; the works at Grimesthorpe, owned by the company, occupy 21 acres. In 1873 the Oaks Colliery, extending over 1100 acres, was purchased.

The Manufacture of Curtain Rings.—In the ordinary process of pressing or stamping brass, as in making curtain rings, the surface cannot be raised by one blow; it requires a succession of blows. This, however, would make it brittle if it were not prevented by annealing the metal from time to time. In the process of annealing it becomes coated with black scale, which can be detached by means of aquafortis. The process of "dead-dipping" to obtain a dull surface, is conducted by dipping the annealed metal in aquafortis (1 part of aquafortis to 4 of water) till the black scale rubs off easily; then, after washing in water, it is dipped into acid of double the strength. This acid will attack the metal and form a green layer on the surface, which really consists of bubbles of gas. When it is well coated it is taken out and washed and rubbed with cold sawdust, and without removing the adhering sawdust is plunged into the strongest acid. It is taken out of this almost immediately, and washed in water containing cream of tartar dissolved, and is lastly placed in hot sawdust.

NEW PUBLICATIONS.

REPORT TO THE COMMITTEE APPOINTED TO STUDY THE MEANS FOR PREVENTING EXPLOSIONS OF FIRE-DAMP. (Rapport à la Commission d'Etudes des Moyens Propres à Prévenir les Explosions de Grisou.) By M. Haton de la Goupillière, Professor of the School of Mines. Paris. Dunod.

In March, 1877, the French Chamber of Deputies passed a law organizing a commission to study the best means for preventing explosions in collieries. The first work of this commission, which consists of such men as Daubrée, Berthelot, Paul Bert, Hébert, Burat, de Marsilly and Haton de la Goupillère, was to depute the author, who was assisted by Messrs. Kuss and Sauvage, both well known engineers, to draw up a preliminary report, giving a summary of the present state of the question. This report is now before us. As a *résumé* of the observations and experiences on record in the French, German and English technical literature, it is unrivalled by anything published in either of those languages. It is admirably subdivided, brief and lucid, numerous references giving the student hints how to extend his field of reading and research. The work is not large, not having more than about 100 pages, so that it will not tax the perseverance of that large class who, though desirous of possessing accurate information on the subject, do not or cannot devote time to a more thorough study of the questions involved. The subject has been naturally divided into three parts: the one embracing the questions affecting the study of fire-damp in itself; the second, gathering and examining critically all the means adopted for preventing dangerous accumulations of the gases. M. Haton de la Goupillière cites numerous analyses of fire-damp, studies its chemical properties, its solubility, affinities, the nature and rapidity of combustion. Similarly he examines its physical properties, and then passes on to the pressure of the gases. He draws a sharp line between the tension of the fire-damp issuing from the coal and the pressure of the vitiated air and gas collected in the old workings. The former, which comes from the coal at high pressures, is little influenced by variations of atmospheric pressure, which the latter follows closely. He advocates with earnestness experimental inquiry into the subject of the influence of variations of atmospheric pressure upon the accumulation of fire-damp, and calls attention to the necessity of aiming at a reduction of temperature, as well as at the replacement of vitiated by fresh air by ventilation. He gives ample space to the investigation of the question of the disastrous influence of coal dust in propagating explosions, and claims for Faraday and Lyell the priority of discovery, they being the ones, it seems, who first touched upon this subject in a report on an explosion at Haswell, published in 1845 in the *Philosophical Magazine*. As a preventive measure the author gives watering of the galleries, which he states has been already organized at Blanzy, Jabin, Saint-Eloy. In the second part of his report the author gives some general facts as to the conditions constituting thorough ventilation; he speaks disparagingly of natural ventilation, and is inclined to reject ovens whenever there is any danger. He clearly points out the respective advantages and disadvantages of aspirating and blowing ventilators, deciding finally in favor of the former. He speaks approvingly of the use of the Koerting injector, used at Noeux and Anzin, with compressed air, and considers it a valuable auxiliary when there are underground engines. Much could be gained in the efficiency of ventilators if care were taken to prevent losses by leaky doors, &c. He condemns such propositions as burning the gases by eternal lamps or a succession of electric sparks or absorbing them, according to Puncham, by chloride of lime, or keeping them in check by such expedients as high pressure, as proposed by Bérard. On the other hand, he approves of Soulary's method of "draining" the old workings. The question of lighting, as affecting security from fire-damp, has hardly received the space which is due it. It is widely hoped by engineers that some one of the numerous methods of producing the electric light by incandescence, which have come before the public recently, may prove of practical value. Among the means cited as available for detecting the presence of fire-damp, we note the "*grisoumètre*" of Coquillion, which has recently undergone some improvements. The third part, on the means employed to remedy the evils produced by accidents, contains some statistics of colliery explosions and the mortality of the miners due to that cause. The efforts of statisticians in this direction have, no doubt, done much good in arousing public attention and leading to measures to remedy the evils as far as possible. But while it is natural that the mortality should receive precedence and enlist much sympathy, we would suggest that figures giving the cost of repairs, the money value of time lost, &c., would be valuable in bringing many who fail to be affected by mortality lists, to a realising sense of the profitable nature of an investment for insuring a colliery against fire and explosions as a business matter. The author, in subsequent chapters on the means of salvage and on fires, gives a good review of the various life-saving apparatus invented by ingenious Frenchmen and Germans. To conclude, we cannot but repeat that M. Haton de la Goupilhère's report is an admirable one, and deserves careful perusal and consideration. We look forward with much interest to the work which will, no doubt, be issued by the commission as the result of its deliberations. That it will go extensively into a recommendation of police measures is foreshadowed in this preliminary report, in which the author expresses his appreciation of the value of mine regulations strictly enforced and well backed by the courts.

The Reading Railroad Company's locomotive that was exhibited at Paris, and which has since been tested satisfactorily on the Eastern and Northern railways of France, has been running in Switzerland, being the first American engine to run upon Swiss roads.

The Iron Age

AND

Metallurgical Review.

New York, Thursday, February 6, 1879.

DAVID WILLIAMS - - *Publisher and Proprietor.*
JAMES C. BAYLES - - *Editor.*
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CONTENTS.

We invite attention to the very able and comprehensive address of Mr. Joseph D. Weeks before the Pittsburgh Chamber of Commerce, which we print on another page. It treats of arbitration as a means of averting the conflicts now so frequent between labor and capital, and gives much information which all classes of our readers will find of value. We know of no one so well qualified as Mr. Weeks to discuss this subject intelligently, and no subject now possesses a greater importance for those engaged in our manufacturing industries.

In an editorial in our issue of January 23, on the outlook for Lake Superior Ore for 1879, we gave it as our opinion that Republic ore would be 50 cents per ton higher for 1879 than for 1878. Our prediction is already vindicated by the fact that, at a recent meeting of the Republic Iron Company, the price of No. 1 Specular was fixed at $7 per ton at Lake Erie ports, cash payments and usual delivery. After the first of May next, should any portion of their estimated product remain unsold, the Company reserve the right to advance the price should they deem it best.

The Pacific Railroad and California Freights.

The attempt of the Pacific Railroad management to ruin the shipping interest engaged in the California trade, is one of the boldest of the many acts of this defiant and unscrupulous corporation. It is generally known that, during the past few months, the managers of the Union Pacific have boldly taken the merchants in the California and Pacific Coast trade by the throat, and forced them into an agreement which is intended to wipe out the California packet lines, and give the railroad a monopoly of the freights exchanged between the Atlantic and Pacific seaboards. The railroad managers claim to have closed contracts with 400 houses in the California trade, requiring them to ship goods only by rail, and neither to buy, sell nor handle any merchandise shipped by water. It is not claimed nor supposed that the merchants who have signed these contracts have willingly put their heads into the mouth of the monopoly which thus seeks to control their business. The consideration offered by the railroad is the advantage of a drawback, reducing the rate to 3 @ 6 cents per pound from New York to San Francisco. The alternative is the requirement of 12 cents on all freights sent by rail; and in many cases we know that merchants to whom these contracts have been submitted for signature have been required to decide at once. When time for consideration has been asked, the answer has been that it must be signed at once or not at all, and that a second opportunity would not be given. The knowledge that a majority of those in the trade had signed or would sign the contract, has determined many who would otherwise have hesitated or refused. Fine goods and seasonable merchandise of all kinds must come by rail or not at all. Heavy freight, carried by water round the Horn at $8 @ $10 per ton will not, of course, stand any such rates as the cheapest of those charged by the railroad company, and those who are thus caught in the noose are practically prevented from doing business in merchandise which will only bear the cost of water carriage. As this subject is of vast interest to many of our readers, we give below the text, so far as its main points are concerned, of a contract sent to a merchant in this city for signature, with the letter of instructions accompanying it:

UNION PACIFIC RAILROAD COMPANY,
GENERAL FREIGHT DEPARTMENT,
S. F., ——— ——, 1878.

Messrs. ——— ———.—GENTS: Referring to our agreement bearing date ——— ——, you are hereby notified that, for the present and until further notice, shipments under such agreement may be made as follows:

From New York via either New York Central and Hudson River Railroad, the New York, Lake Erie and Western Railroad (formerly called the Erie Railway), the Pennsylvania Railroad, or the Baltimore and Ohio Railroad; from Boston via either the Boston and Albany Railroad or the steamers of the B. & O. line; from Philadelphia via the Pennsylvania Railroad. Freights from any and all of above-named points should be marked and consigned care C. F. F. L., Chicago—*i. e.*, care California Fast Freight Line, Chicago.

Yours, truly,
(Signed) E. P. VINING, J. C. S.

[COPY.]

This agreement, made and entered into this ——— ———, 1878, by and between the Union Pacific Railroad Company, party of the first part and the firm of ———, party of the second part—

WITNESSETH: That, in consideration of the agreement made by the party of the second part, as hereinafter described, to be by said party of the second part fully performed, maintained and fulfilled, said party of the first part hath covenanted and agreed, and doth hereby convenant and agree, that upon all the goods, wares and merchandise shipped from the cities of New York, Boston, Philadelphia and Baltimore, all or either of them, and consigned to the said party of the second part at San Francisco during the year ending the ——— ———, A D. 1879, the freight charges shall not exceed the following rates, in United States currency, per 100 pounds, gross weight, namely: Upon all freight not hereinafter specially provided for, the rates provided in the freight tariff published as being in fore between the cities named on the 28th day of February, A. D, 1878, a copy of which tariff is attached hereto and made a part of this agreement. * * * * * *

Said party of the first part furthermore agrees that in case said party of the second part has made or received freight shipments by rail from Eastern cities to California, as hereinbefore described, between the —— day of ———, 1878, and the day of the date hereof, and during said period of time has neither shipped, nor caused nor permitted to be shipped, any goods for the use of, or sale by, said party of the second part by any water route, the rates hereinabove provided for shall be applied upon such rail shipments for said party of the second part during the period last above named, in the same manner as if such shipment had been made after the date of this agreement. * * * Said party of the first part further agrees that in the event of a discontinuance of its present relations with the Pacific Mail Steamship Company, which shall result in greater competition for the traffic between New York and San Francisco, the rates to be charged the said party of the second part shall not exceed those current by the Pacific Mail Steamship Company's vessels at the time of shipment by more than $1.50 for all goods rated by this agreement at or above $4 per 100 pounds, or $1 per hundred pounds for all goods rated by this agreement at less than $4 per 100 pounds. * * * It being clearly understood to be the object and purpose of this agreement to secure for and give to the said party of the first part the transportation of not only that class and portion of the freight of the party of the second part which has hitherto been shipped by rail, but also that class and portion which it has been the custom of the party of the second part to ship by way of the sea, and from which the party of the first part has heretofore enjoyed no benefit or revenue.

It is also mutually understood and agreed that the special rates of freights herein named are for the sole use and benefit of the said party of the second part, and the said party of the second part hereby agrees not to allow the use of its name or shipping marks in any way or upon any class of freight by any other party or parties which shall secure for said other party or parties the benefit of the said special rates of freight. It is further mutually understood and agreed by and between the parties hereto, that all the freight covered by this agreement shall be shipped to Council Bluffs or Omaha by such carriers as may be designated from time to time by the General Freight Agent of the Union Pacific Railroad Company, and that the party of the first part shall not be deemed or held responsible for any overcharge in the rates of freight which may be made upon goods that shall not have been so shipped by the carriers so designated; * * * and that in case of doubt as to the exact nature of the contents of any package of freight consigned to said party of the second part, the carriers shall have, and are hereby accorded the right either to open said packages or to inspect the original invoices of purchase for the contents of said packages, in order to determine the proper rate to be charged thereupon, and that in case it shall be found that any such package contain freight of a higher class than that specified by shippers of same, the nature of the goods having been willfully misrepresented for the purpose of obtaining a lower rate upon same than that which would have been obtained under this agreement had the goods been truly described, the carriers shall have and are hereby accorded the right to charge upon such package or packages so misdescribed double the regular tariff upon same.

In witness whereof, we have hereunto set our hands and seal, upon the day and year first above written. (Signed) * * * * * * * * * * *

As might have been expected, this bold operation on the part of the railroad company has aroused a vigorous and united opposition. Mr. Regan's bill for the regulation of inter-State commerce, supported, as it is, by a powerful mercantile and shipping influence, is a direct outgrowth of this movement. Its effects have already been seriously felt by the California trade, and yet the houses engaged in the trade, with a few exceptions, have passively accepted the conditions offered them, and, bitterly as they deplore the position in which they are placed, none of them appear to have the courage to oppose the railroad company in its destructive policy. The California shipping trade by way of Cape Horn is one of the most important branches of American commerce. Of late years the vessels, about 400 in number, engaged in this trade have carried freights averaging $15,000,000 in value. The owners of these vessels, which represent an invested capital of about $20,000,000, cannot allow their vessels to stand idle, nor are they in a position to compete with the railroad on the basis of a contract with shippers forbidding them to purchase or deal in, or receive on consignment, merchandise carried by sailing vessels. The usual voyage of a California clipper is as follows: First, it takes a cargo of coarse freight from New York to San Francisco. At San Francisco it loads with grain for London or Liverpool. At London or Liverpool the vessel takes a heavy cargo for San Francisco. Having completed this Anglo-California transaction, the clipper takes a cargo of coarse commodities for New York, and returns to this port again, to repeat the same routine on a second voyage. It will be seen, therefore, that our ship-owners can afford to take freight from New York to San Francisco, and finally from San Francisco to New York, at merely nominal rates—rates that will pay for the handling only—provided their trips from San Francisco to London and return can be made to pay fair rates of freightage. This measure has been strongly urged upon the large California shipping agents. We believe they have not thus far decided to adopt the plan suggested, but it is understood that they are anxious and willing to accommodate to the fullest extent those who stand in opposition to the railroad, and are thus made dependent upon the facilities offered by the clipper lines.

It is not supposable that the California shippers and merchants will long remain in their present attitude of quiet submission to the control of the railroad managers. So arbitrary a policy as this cannot fail to entail serious and far-reaching evils. What these are, as affecting the iron and hardware interests, and how it is proposed to free this important trade from the yoke of an odious and insolent monopoly, which snaps its fingers at the Government and knows no interests but those that center in the Stock Exchange, we shall endeavor to show in subsequent issues.

Consuls and Commercial Agents.

Our trade relations with Central America are in some respects quite satisfactory. Business is improving, and new articles manufactured in the United States are being introduced there. Nevertheless, inquiry among our merchants in the Central and South American trade, reveals the fact that there exists among them very general dissatisfaction with our commercial representatives in those countries. In vain do we go to the foreign consuls resident here in search of a remedy, for they are not disposed to run a tilt with the State Department at Washington. What, then, is the matter? Answer comes that the English trader already occupies the ground, and cannot well be either dispossessed or encroached upon, "until," as we are told, "our government secures a "better representation abroad." A gentleman who must be considered an authority, says: "We need good men, who are "acquainted with the products, whether "natural or manufactured, of the United "States and can speak intelligently of "them. In Guatemala, San Salvador, "Honduras and throughout that entire "section, they don't know anything about "United States produce and have no one "to inform them." The United States have only one minister in all the five republics, and even he, it is charged, spent nine months of last year at home. Plainly stated, what our exporters want is a competent commercial agent in each of the several republics who, first of all, shall be prohibited from doing business on his own account; his salary to be large enough to engage his entire services. He should be allowed a depository or warehouse, in which to exhibit a full line of samples of products of the United States, the same to be accompanied by an illustrated catalogue. If such a plan were adopted, it is believed that the manufacturers of the United States could easily find means of sending out specimens of their goods, with the assurance that their products would be properly represented. When such an agency is once permanently established, dealers in those countries would know how to supply themselves with articles made here, and learn how to make selections. This scheme, it is said, could be carried into execution without any great additional expense to our government in maintaining representatives abroad, while the advantages would be immediately apparent.

Our merchants claim to have had little information or encouragement from the general government in any form outside of official documents to the Department of State, which too often are of little practical value. To indicate what is actually going on between the United States and some of the countries above named, it is stated that very recently plans have been sent out for railroad bridges required in Costa Rica, to cost $4,350,000, and calling for 3000 tons of iron. Besides large quantities of material already sent, a sailing vessel is about to load for Honduras, with 100 tons of telegraph wire among her cargo. Within the present year two vessels have left for Central America, taking out 1200 tons of freight, *via* Cape Horn, and a third will leave soon with miscellaneous merchandise, all of which shows increasing activity. We learn that at the consular offices in this city inquiries are received every day with the object of knowing who are the leading merchants in various localities. Parties with above consignments might be intrusted, but all are referred to the State Department at Washington, whence they can obtain the name of the nearest consul. A mercantile directory of the Central American States would be invaluable.

In the foregoing remarks we have fairly represented the opinion of a great many merchants interested in foreign trade. The fact that our consular service does not furnish them all the information they need, and that commercial agents are not sent out to canvass for trade and run permanent industrial exhibitions at the government expense, is regarded as an evidence that the State Department does not take a proper interest in this part of its work, and that Congress is indifferent to the interests of trade in not making liberal appropriations for this specific purpose. We are compelled to differ from this view of the case. We have no doubt that many gentlemen secure appointments to foreign consulates and commercial agencies, who have few or no practical qualifications for the collection of valuable commercial intelligence, and whose judgment in trade matters is worth very little. This is to be regretted, but probably it is inevitable. A man who has business talent and experience, and who could do all that our exporters would be apt to expect of him, can almost always earn more money as a merchant or an agent than the government could afford to pay him in the shape of salary. Such men are not often found among the applicants for the small offices in the gift of the State Department, which are held by a precarious tenure when obtained; nor could many of this class be induced to accept appointments if they were offered them. We think the Secretary of State and his assistants entitled to great credit for what they have already accomplished in making our consular service commercially useful, and that, instead of complaining, our merchants should be well satisfied with present benefits.

We warn our merchants who are interested in the export business against depending upon the government to find trade for them, or to make foreign markets for American goods. This is not the business of the government, nor could the public funds be properly used for any such purpose. If the State Department were able and willing to undertake this work on the scale proposed by some of our merchants in the foreign trade, it could do it neither so cheaply nor so well as it could be done by private enterprise. It is the business of the merchant who seeks to establish trade with a foreign market, to familiarize himself with the wants of that market and the means by which those wants can be supplied. It is a neglect of this careful study of the field by personal inspection, or through the correspondence of competent and responsible agents, that accounts for many of the mistakes thus far made. We know of one instance in which a scale manufacturer sent a large consignment of scales to Russia, but forgot that the Russians had no use for scale beams marked to record pounds and ounces. Had he given the matter proper study, he would have made the discovery before the goods were sent, and not after they had reached their destination. The consular service of the United States might perhaps be much better than it is; but however good it might be, it would still rest with our merchants to find markets and supply them, and the less they depend upon government reports and the more they rely upon their own enterprise and sagacity, the better it will be for them and for trade generally.

Pittsburgh's New Water Works Engines.

Those of our readers who are interested in hydraulics, are aware that Pittsburgh has been engaged for the past six or seven years in building an immense water works, at a cost of several millions of dollars. The engines are on a new and comparatively untried plan. Hydraulic engineers who have examined them have almost universally condemned them, and have been free in their prophecies that they would not work successfully. A short time ago the second pair of engines were completed, and various fitful attempts have been made to run them, but there has always been some good reason for not operating them regularly. Now, when the engines are finished and in position and should be ready to operate, it is claimed that the iron used in the various castings is not up to the standard required by the contract. The mechanical engineer in charge of the work, who is also the inventor of the engines, and who, by the terms of the contract, is made the arbitrator between the city and the contractor for the engines, certifies to this fact. He states that he has taken 130 samples from the principal castings and tested them. The specifications require the cast iron used in the construction of the engines to stand a tensile strain of 25,000 pounds to the square inch. The results of the test made of the iron taken directly from the principal casting of the first pair of engines, and now in position in the pump pit, is as follows, as shown by the report of the mechanical engineer: The average tensile strength of the iron in the valve chambers is 20,862 pounds per square inch, or 16.7 per cent below the standard. The average tensile strength of the iron in the air vessels is 19,029 pounds per square inch, or 23.9 per cent below the standard. The average tensile strength of the iron in the check valve chamber is 13,365 pounds per square inch, or 46.6 per cent. below the standard. The average tensile strength of the iron in the pump barrels is 17,870 pounds per square inch, or 28.6 per cent. below the standard. The average tensile strength of the iron in the plungers (including the one broken) is 17,998 pounds per square inch, or 28.1 per cent. below the standard. The average tensile strength of the new plunger (made to replace the one broken July 23, 1878,) is 25,903½ pounds per square iuch, or 3.6 per cent above the standard. The average tensile strength of the plunger head is 14,092 pounds per square inch, or 43.7 per cent. below the standard. The foregoing are the results of tests made of the iron taken out of the principal castings now in the pump pit of the first pair of engines, and with the exception of the new plunger referred to and also a sample taken out of the pillow block casting for beam shaft (made to replace the one broken July 23, 1878), not one stood the test required by the contract. This sample, taken from the new pillow block (the only casting in the upper works that has as yet been tested), stood a tensile strain of 33,109 pounds per square inch, and is 32.4 per cent. above the standard.

The next nearest approach to the requirements of the specification was found in the iron taken from the second section of the middle air vessel, and which broke when subjected to a tensile strain of 24,863 pounds per square inch. The lowest test recorded of iron taken from castings that will be required to stand the full pressure when the machinery is in operation, is from the check valve chamber of No. 1 engine. This sample broke with a tensile strain of 12,312 pounds per square inch. This is fully 50 per cent. below the standard specified. In addition to the poor quality of the iron used in the construction of said check valve chamber, it was found that the walls of said chamber at this point were 14 per cent. less in thickness than is shown in the drawings furnished. There are also other castings which have not the specified thickness, but they are not made of so low a grade of iron. Some of the tests made of the plunger heads show a still lower tensile strength; as, for example, the sample from the plunger head of No. 2 engine, which stood a tensile strain of but 10,185 pounds per square inch. These are only some of the defects of this wonderful pair of engines. Fractured valve chambers, defective segments of fly-wheels, bad fitting, brasses in the cross-heads not parallel, the brasses of the connecting rods requiring liners, center of fly-wheel bored too large for shaft, besides a number of unspecified mistakes in construction which are classified as minor defects.

This is a most extraordinary state of affairs. After seven years' time and the expenditure of millions, Pittsburgh wakes suddenly to the conception that something is wrong. The fact is, that in this matter the action of the Pittsburgh authorities from the first has been a marvel of official stupidity. The first mistake was in selecting an engine which was an experiment. Water works engineering is no new science, and an engine could have been selected that has stood the test of years and could have been built at a less cost and without any danger of failure. The city chose a different course,

contrary to the advice of experts, and now it is enjoying the result. The probability is that it has a lot of poor and unwieldy scrap on its hands. Attempts may be made to run the engines, but they will be a constant source of expense in repairs, and in the end it will doubtless be found cheaper to throw them away and put in new ones.

American and English Locks.

In the discussion that has been in progress, notably since 1876, regarding the character of American hardware and the probability of its introduction into foreign markets, there has been a good deal said that was sense and considerable that was nonsense. The nonsense has not been confined to either side of the water. If we have somewhat boastfully proclaimed our ability to distance all foreign competition, and assumed that our manufactures were about to drive all other goods out of the markets of the world, our English neighbors have not been behind us in assumption. In a word, if the nonsense of the American has cropped out in boastfulness, that of the Englishman is shown in over-confidence in the superiority of British manufactures. The discussion in England over the discovery that the War Office has been buying American locks, shows that this over-confidence has been somewhat rudely shaken, and yet has not been destroyed. The *Ironmonger*, for example, is a journal that generally has but little of nonsense in its columns; and yet, discussing this lock question, it says editorially: "We can "make better goods than any other nation "if we will be at the trouble to do so."

With all due deference to our friends of the *Ironmonger*, we would class this as part of the nonsense to which we referred at the beginning of this article. That they can make as good, we do not deny. We have said again and again in these columns, that those who thought they were about to drive England out of the markets of the world by reason of the superiority of our goods, were deceived. That England could make goods to equal ours, and would do it when the necessity was forced upon her manufacturers, we have always believed. That they can make better we deny, and in the face of the facts, are justified in our denial.

Another example of this nonsense from over the water appears in the same issue of the *Ironmonger*. The great lock manufacturing center of England is Willenhall. The Council of the Chamber of Commerce of Wolverhampton met on the 17th of January to discuss this question of locks, and inspected specimens of both American and English made locks. The decision arrived at was that the American article was superior in appearance, but less durable than the English one. This is somewhat like the famous verdict of a Western jury: "Not guilty if he'll leave the town." How can the question of the durability of an American lock be judged by its looks? And what does the assertion mean? What grades of locks were compared—those of equal price or unequal? The fact that one might be cast and the other wrought iron proves nothing, for we presume it will not be denied that castings are made every day from our American charcoal irons, that have a tensile strength equal to a good deal of English wrought iron. It seems, from the report, that an American cast lock was "struck with a light hammer and easily "broken to pieces." There is a good deal of nonsense in this. In America, as a general thing, rim locks are not put on the outside, but on the inside, of the door, and a burglar with a hammer to strike it must first get at it, and to get at it he must be in the room, and if in the room he probably will not trouble himself to learn whether the lock is made of "ordinary cast iron," or wrought iron or brass.

It is an unquestioned fact that England and the United States are, in the near future, to contest for the trade of the world. Neither will get it all. Into this contest it is sheer folly to go with false impressions. If our American readers think this trade is a ripe plum which they have only to reach after, they will be sadly mistaken. If our English friends solace themselves with the idea that they can make better goods than all the rest of the world, they also will find themselves mistaken. This is a contest in which opinions will not win, nor will it be decided by preconceived notions. It will be honest, sturdy work, and the sooner both sides remember the first axiom in war, not to underrate the enemy, the sooner they will get down to the difficulties before them. To those for whom this subject has interest, we commend a careful reading of the weekly letters of our very intelligent and well-informed English correspondent.

The Pittsburgh pig iron market has shown considerable activity the past week, some 4,000 tons having been reported as sold in a jobbing way by the brokers, as against an average of something like 1000 tons for a number of weeks past. The product of the local furnaces is not included in this amount.

Effect of Railways in Centralizing Population in Germany.—Some interesting figures relative to the influence of railways on the increase of the town populations of Germany, have recently been published in an article in the *Allgemeine Zeitung*. Of 2528 towns of over 2000 inhabitants, only 807, in the year 1867, were provided with a railway. In 1871 there were 1049, and in 1875, 1270. In the course of these eight years the total population of 2528 towns rose from 8,848,000 to 12,424,000. Of 1837 towns of from 2000 to 5000 inhabitants in 1867, there were 1388 without any railway communication. In 1871 they had fallen to 1263, and in 1875 to only 1095. Of 591 towns of from 5000 to 20,000 inhabitants in 1867, 268 were without a railway; in 1871, 213, and in 1875, only 162, while those provided with railways increased from 323, with a population of 2,759,000, to 429, with a population of 4,000,000. Of the 88 towns of from 20,000 to 100,000 inhabitants, all were provided with railways in 1875. Their population increased from 2,750,000 to 3,500,000 during the interval in question. Of towns of more than 100,000 inhabitants, all, of course, also provided with railways, the population increased from 2,050,000 to 2,665,000. The total increase of the population of the towns of more than 2000 inhabitants, from 1871 to 1875, was 1,511,000. The population of the whole German Empire only increased in the same period by 1,658,000.

The Iron and Mining Interests of the Southwest.

The following interesting items of information, relating to the iron and mining interests of the Chattanooga district, have been received from Mr. S. B. Lowe, manager of the Southern office of *The Iron Age*, Main and Eighth streets, Chattanooga:

ROANE IRON WORKS.

As the readers of *The Iron Age* are aware, the company managing these large railroad bar works, some two years ago projected and began building steel works. This enterprise was quite in the way of the men who manage these mills, but there was, in this instance, a spur of necessity. The Southern railroad companies have learned the superiority of steel tracks in cheapness and safety, and steel tracks they determined to have. Several of them have already laid their heavy grades with steel rails, while some are of that material from end to end. The days of the iron rail are numbered in the South, as well as in the North. It follows, therefore, that the mill which sells bars to the South must sell steel bars. This course of reasoning induced the Roane stockholders to go deep in their pockets for the money to build a first-class steel plant. The Siemens-Martin process was adopted. The heavy machinery was contracted for with the best Eastern and Northern makers, is all in position, and works "to a charm."

When this was all done the question remained to be tested, "Will iron made from our ores make steel?" That question is clearly settled in the affirmative. The ore used is classed as gray specular and brown hematite, and is found near Cartersville, Ga., and on the line of the S. R. & D. R.R., About 6000 tons of pig has been made from this ore by the Chattanooga Iron Company for the Roane Company, something over 1000 of which has been converted into ingots. A few hundred tons of the latter were bloomed and cut into billets, and a portion was rolled into rails. The first rail made was a perfect specimen. Not more than three rails failed in a lot of 25 tons. Several of the lot were tested, haphazard. A 600-pound weight was let fall on them from a hight of 7 feet, the rails resting on bearers 4 feet apart, and the weight impinging in the middle. One rail only was broken, but not until after it was "nicked" all round the surface with a cold chisel. It was struck by the weight 17 full blows. Bessemer rails from different Pennsylvania mills were tested in the same way, with less satisfactory results. A fragment of a chance billet was forged out into a rod several feet long and three-quarters of an inch square. A piece of this rod was reduced by chemical action to the temperature of zero, and at that temperature was bent by blows from a forge hammer until the two ends of the piece were at right angles with each other, the "turn" not occupying more than four inches of the rod. Then the end of the rod was bent cold prone down upon the rod. In neither case was there a crack perceptible in the face of the bar, where the greatest strain was endured. Then about four feet of the ¾-inch bar was forged out into a ½-inch bar, and this was given ten twists cold, without a crack or break, or sign of either. These experiments ought to satisfy any candid mind that steel can be made from our ores of excellent quality. That it can be and will finally be made as cheaply here as anywhere in this country, will certainly not be doubted by real ironmasters or steel experts.

The only drawback here has been in securing roofs to the converters which would stand. The material used was "flexible," silicious sandstone, procured near Cartersville, Ga. It stands heat splendidly, but in its natural state it is ragged of surface and loose and shelly in structure. These incidents of formation prevented linings made of it from enduring, because the expansion caused by the intense heat must displace the material, and finally throw down the wall. It would be a perfect material to make a salamander brick of, which would be as good as any in the world.

The furnaces are now being relined with the celebrated Woodland brick from Pennsylvania, which material has stood in Siemens-Martin furnaces steady and continuous heat for eighteen months. The management have also ordered some brick from Wales, which are claimed to be even superior to the Woodland. The furnaces will be relined by the first of the coming week, and being in as perfect order as the machinery, by the 13th or 14th instant it is expected the whole will move off together harmoniously.

The company have "in sight" plenty of orders for steel rails; but the grand result of their final success in this undertaking will by no means be confined to the railroad business they may do. It must give a powerful impetus to the industries of the Southern iron district, and bring in its train more enterprises and more immigration of labor, skill and capital, than any event that has occurred since the war.

THE VULCAN WORKS.

This establishment has had no late improvement or addition to its various departments. The management are now operating 28 nail machines full time, and finding a ready market for the product. All departments, bars, spikes, bolts, bridge and car bolts, light rail and general forgings are running to their full capacity. The market for the products is daily growing. At the present rate the works will turn out during 1879 their entire capacity of 9000 tons, and the prospect is that the present rate will have to be maintained to meet the demand. The company ship as far southwest as Texas, and south to nearly all points of any importance on the Gulf, and enjoy a good trade in the interior, both north and south of here.

TENNESSEE IRON AND STEEL COMPANY.

These works, in charge of the Messrs. Scofield, who are principal stockholders, have a capacity of about 10 tons of bar, small rail and fish plate, daily. The mill began operating about two years ago, with a capacity of five tons daily, which has been doubled in that time, the management being always pushed to fill their orders since their product was fairly introduced. The management has been economical, the officers of the company doing the office work and superintending—a style of doing business which might have saved many concerns from collapse, had they adopted it in the beginning of the "hard times."

GILLS & CO.

own and operate the Cumberland Pipe Foundry and Machine Works. The proprietors are practical men in all lines of casting and superintend their own works. They did considerable of the heavy work pertaining to the Roane Steel Works, which gives entire satisfaction. They are now projecting new pattern machine shops and other additions, which will materially add to their capacity. The pipe foundry, which has a capacity of 15 tons daily of gas and water pipe, is full of orders, as is also the heavy casting department. This firm moved to Chattanooga from Nashville in 1877. Their structures and fixtures are all new and cost about $50,000.

CHATTANOOGA IRON COMPANY

own and operate the furnace at this point. They have been blowing for several months on a contract for "steel pig" for the Roane Iron Company. This contract was determined by notice in the last days of December, and the company are now using red fossil ore from near Attala, Ala., and making iron on their own account. They have experienced some difficulty in getting ore from the Half-Moon beds to mix with the Alabama article, on account, first, of low water, and latterly, because of ice running in the river. It is expected to have in hand a full stock of ores very soon, when the furnace will be put to its full capacity. The iron turned out by this company has heretofore commanded a considerable market in St. Louis and at other northern points, for wire-drawing and other special purposes. It is made as cheaply—perhaps, considering advantages of market and transportation, more cheaply—as iron of the same quality can be made in the surrounding district. This furnace was blown in in the spring of 1874, and except necessary delays for making repairs, has been constantly in operation since that time.

WASON CAR & FOUNDRY COMPANY.

These works were about completed when the reverses of September and October, 1873, sent the business of the country down to zero, and the consequence was that the establishment started under rather gloomy prospects. The panic stopped the roads from buying a wheel as long as an old one would hold together, and completely checked the purchase of cars. Nevertheless, the wagon works have gone on with their business, and have found it steadily growing on their hands. The demand for cars from Southern roads is bound to improve, and it cannot be long till these and other works in this section will do a full and flourishing business. When that time does come a completely equipped works like this will have two decided advantages over those located further north—superior and cheaper timber and iron, and saving in transportation.

ETNA FOUNDRY AND MACHINE WORKS.

This concern makes the Todd turbine wheel, engines and general castings, and has been in successful operation about four years. Lately Mr. Wheland, the proprietor, has taken an interest with Mr. Newel Sanders in the manufacture of chilled iron plows. These were made in considerable number last season, sold readily, and made a good reputation. The market will require an enlarged number to fill the demand this year, and the proprietors are pushing things to that end. The business bids fair to grow rapidly.

J. C. HOYT & CO.'S FOUNDRY.

This manufactory of sole and belt leather has steadily been increased in capacity, until it is now one of the largest of the kind in the country. The hides put into vats average about 140 per day. The bark is supplied from the Tennessee Valley and from Northern Georgia and Alabama. They work an average of about 100 hands.

Of new enterprises, there is the woodworking establishment of Steward & Steward, just started. They will, when fairly going, turn out from 25 to 50 dozen washboards and about 500 nail kegs per day, and will also make several articles of fancy furniture.

WILDBERGE, PEYER & CO.'S

cotton mill, which was burned in October, is being rebuilt on a more extensive scale than before. The company hope to be in full operation by midsummer.

THE MOVEMENT OF PIG IRON

from this district northward during the six months ending Dec. 31, 1878, was 13,950 tons; for the preceding six months, 14,183 tons; for the year, 28,133 tons. The shipments this year will be double those of last year, unless prospects are deceptive. The total local consumption of Chattanooga in 1878 reached about 10,000 tons, which will be largely increased in 1879.

TECUMSEH FURNACE,

Tecumseh, Cherokee County, Ala., turns out hot-blast charcoal iron of superior quality. The stack is 60 x 12, with open top, and its annual capacity 10,000 net tons. This furnace was last blown in on June 18, 1875, and has never been out of blast since, a period of 43 months. The furnace has done better during the last nine months than it did in any corresponding period since its erection in 1874, and better in both quality and quantity of metal in the last month of 1878 than in any other month. The furnace is on the Selina, Rome and Dalton Railway, and sells its irons to consumers of fine charcoal irons in Georgia, Alabama, Tennessee, Kentucky, and in the Northern States. The superior quality of the product is the fact which has enabled the management to keep steadily in blast over three and a half years. The business is directly supervised by Gen. Willard Warner, the able and energetic president of the company.

SEWANEE MINE.

The following table shows the last year's operations of Sewanee Mine, owned and operated by the Tennessee Coal and Railroad Company, A. M. Shook, general manager in charge:

	Coal		Coke	
1878.	Cars.	Tons.	Cars.	Tons.
January	869	9,087	236	2,385
February	721	7,458	220	2,283
March	588	6,071	231	2,437
April	564	6,107	166	1,770
May	577	6,080	135	1,451
June	390	4,038	146	1,990
July	574	5,961	169	1,759
August	687	7,587	197	2,100
September	698	8,003	145	1,666
October	872	9,904	162	1,918
November	724	7,963	215	2,450
December	1,006	10,768	206	2,286
Total	8,270	89,000	2,028	24,475

This mine and the ovens are worked almost entirely with convict labor, the company owning it having a lease of the State penitentiary. They are now having machinery built with a view to crushing and washing their coal for coking purposes. When this is done, the Sewanee Mill will certainly turn out as good a coke as is made in the world. It is even now regarded by iron makers as a decidedly superior coke for furnace purposes—fully up to the best unwashed products of the Pennsylvania or Ohio ovens.

RISING FAWN FURNACE.

Rising Fawn, Georgia, coke, 60 x 16, has been in blast steadily about 11 months, under the superintendence of Colonel B. E. Wells. In that period it has produced something more than 11,000 tons of pig, an unusually large proportion of which has been foundry.

NEW ENTERPRISES.

As to the prospects of new enterprises, it may be positively stated that one furnace will be erected this year specially intended for the production of high grades of car-wheel metal; also that one furnace now idle will be blown in soon, with a view to making car-wheel pig. This grade of iron is scarce. The leading makers and dealers are practically out of it, and behind their orders considerably.

SODDY COAL MINE

is situated 20 miles above Chattanooga. The entrance is about a mile from the Tennessee River. The vein is the middle measure of the Cumberland coals, is heavily overlaid, and therefore solid and heavy. The vein averages about 3 feet 6 inches in thickness. The coal is a free burner and a good coking coal. It is well adapted both to household and rolling-mill uses. The output during 1878 was 500,000 bushels (20,000 tons). This will be doubled in 1879. The entry is within 1400 yards of the main track of the Cincinnati Southern Railway, and when that line is complete the company will still further increase their capacity. They now employ 50 miners. They employed an average of 35 last year. Their only outlet heretofore has been the Tennessee River. During the last year their largest sales have been to the Roane and the Vulcan iron works.

SALE CREEK MINE

is a vein which lies directly under the entire mass of Wallen's Ridge, being some hundreds of feet lower than the Soddy. The vein is about four feet thick. The coal is bright, hard, and an excellent steam coal. It will find a ready market among the railways for locomotive fuel. Sale Creek is a short distance northeast of Soddy, and the entry now being driven is 1900 yards from the main track of the Cincinnati road. The bottoms of both these mines are nearly level, with a gentle outward slope, requiring no artificial means of drainage. The idea that either of these is identical with Rockwood vein has grown out of the fact that the old Sale Creek Mine was a series of pockets similar to Rockwood. In fact, both these are lower than Rockwood, and the coals are entirely different.

DADE COAL AND COKE WORKS,

Dade county, Georgia. The output of these works for 1878, estimated by the superintendent, is 57,000 tons coal and 18,000 tons coke. The present year will realize a much larger product, probably nearly double that of last. The coke produced at these mines has been greatly improved of late, and we understand will be further improved by the erection of crushing and washing machinery at an early day.

SOUTHERN STATES COAL, IRON AND LAND COMPANY.

South Pittsburg. This company will have completed, early in January, their furnace stock No. 1, 20 x 70 feet, and expect to be in the market with their pig iron in March. The management will combine the hard and soft red with brown hematite ores, thus obtaining in the product the strength of charcoal iron and the fluidity of pig made from red ore. The fuel will be entirely washed coke, a very superior article. The limestone is nearly a pure dolomite. It is reasonably and confidently expected that the pig must be very low in silica. Special pains will be taken to have it as low as possible in phosphorus, and if not strictly neutral iron, it will at least be a high grade of gold-short. The company will do open sand castings in the usual way, and at close prices.

In their extensive shops the company are prosecuting their own work; have on hand several saw-mill jobs for various points in the South; are building the crushing and washing machinery for the Sewanee Coal and Coke Works, and have in progress negotiations for building the boilers and engines for a river steamer, and other heavy work in hand or in prospect. They build their own cars, which are models of strength and general utility. They will have this branch of their elaborate works so far completed by April that they will be ready then to take orders for building freight, flat and stock cars. In these lines of work the company will certainly be in position to offer special inducements to buyers. They will be producers of both the iron and wood, and will charge but one profit on those articles. They also produce fire-brick and common brick. Almost everything in the way of raw material is found on their large estates in great quantities and of best quality.

Since purchasing the Battle Creek Colliery, the company have greatly enlarged their capacity by driving a second entry and connecting it with the old one by tramway. This excellent household and gas coal is supplied to consumers in Middle Tennessee, there being full demand for every bushel that can be gotten out. At Victoria the company are producing washed coke from their excellent coal, which is being used in Nashville, Chattanooga, Knoxville and Atlanta by founders, and meets with entire approval from the list of consumers, which is steadily growing. This excellent coke, pronounced by experts to be a most perfect article, is placed in Chattanooga, free on cars, at 11 cents per bushel—a material reduction on the price of the only foundry coke heretofore offered in this district. This should be both a relief to present consumers and encouragement to others to embark in manufacturing lines which require this grade of fuel.

The company have secured extensive deposits of clays and other minerals in Alabama, from which they are producing two classes of bricks, one being high in silica and porous in structure, and intended for use in coke ovens and the crowns of puddling furnaces, and the other is a dense, compact brick, intended for blast furnaces, foundry cupolas and puddling furnace hearth. The immense estates of the corporation, out of which they are beginning to dig coal ore and other minerals, are being utilized, as to the surface, by letting them in parcels to sheep farmers. The surface products are also being cut into firewood, lumber, shingles and tan bark. Their later developments consist in finds of large beds of superior red and brown hematite ores, and a splendid bed of hard cubical coal. Once these are reached by railway facilities, they will furnish cheap ores and superior fuel to East and Middle Tennessee consumers.

CHARLES G. JOHNSEN, NEW ORLEANS.

This is one of the largest and best-managed foundry and machine works in the the South or in the country. It turns out all kinds of wood-working machinery, portable and stationary engines, cotton gins and presses, and makes a specialty of plantation sugar and cotton machinery. It has also done considerable in sugar-refining apparatus, shipping some of this kind of work to Philadelphia. The molding floor is 170 by 150 feet, being one of the largest, if not the largest, in the country. The lathes, planes, engines, all the machinery in the establishment, was made there, and is excellently adapted to the use made of it. About 600 hands are employed, and the business is steadily growing. A late visit to these large modern and ably-managed works showed them in excellent condition and full of work. The proprietor confidently anticipates a decided improvement in his business during this year.

A Large American Iron Manufacturing Firm.

Edward Cooper, Mayor of New York city, entered into partnership with Abram S. Hewitt, in the manufacture of iron and steel, in 1844. Their business was from the first extensive, and it is now of immense magnitude. Under the name of the Trenton Iron Company, the firm own a rolling mill with a capacity of 6500 tons per annum, and a wire mill with a capacity of 5000 tons a year. They also possess the New Jersey Steel and Iron Company, of Trenton, which has a puddling mill with 12 furnaces; a top-and-bottom mill with four heating furnaces; two sets of 19-inch rolls, and engines and condensers for flattening rails and rolling flats; a finishing mill with seven furnaces, &c.; a merchant mill of a capacity of 4000 tons per annum; several furnaces for various other purposes; chain works in which all varieties of chains are made, from a cable to a harness chain; a horse-shoe shop, a pump house and a machine shop. The Trenton Water Power Company, which the firm control, own the water power on the Delaware at Scudder's Falls, seven miles above Trenton, and supply 15 manufacturing establishments with water power.

The Durham Iron Works, on the Delaware, near Riegelsville, 10 miles south of Easton, Pa., stand on an estate of about 1000 acres, and consist of a blast furnace, engine and boiler houses, hot-blast ovens, foundry, cast house and laboratory, pattern shops, repair shops and various other shops. The blast furnace has a capacity of 15,671 cubic feet, and can produce 450 tons weekly. The Ringwood Iron Works cover more territory than any other controlled by Cooper & Hewitt. There are 20,000 acres of land, mostly in Passaic county, New Jersey, two blast furnaces operated by water power, and numerous large mines. Some of them were worked for an English company before the Revolution. They have furnished to date upward of 600,000 tons of ore. The vein of the Cannon Mine—the largest—is 100 feet wide. Two of the mines are named, respectively, "Cooper" and "Hewitt." The ores at Ringwood yield about 60 per cent. of metallic iron. Cooper & Hewitt are also the largest owners in the Alliance Coal Manufacturing Company, at New Philadelphia, near Pottsville, Pa., the yield of which is 300 tons daily.

AMERICAN SCREW CO.,

Providence, R. I.,

MANUFACTURERS OF MORE THAN 4000 VARIETIES OF PRODUCT,

AND INCREASING THE ASSORTMENT DAILY.

Machinery employed contains important inventions recently patented, and which are designed to produce Screws at a **lower cost to the consumer** than has ever been attained.

All goods are distributed through the Hardware trade, to whom a liberal discount will be allowed.

(No. 235.)

INTERNATIONAL EXHIBITION.

PHILADELPHIA, 1876.

The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons, and decreed an award in conformity therewith.

PHILADELPHIA, November 8, 1876.

REPORT ON AWARDS.

Product: **Iron, Brass and Steel Screws, Tire and Stove Bolts, Rivets.**

Name and address of Exhibitor: American Screw Company, Providence, R. I.

The undersigned having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for Award, for the following reasons, viz:

Being of a quality nearly approaching perfection, showing the highest attainment in this branch of manufacture.

G. L. REED. Signature of the Judge.

Approval of Group Judges.

Daniel Steinmetz, G. L. Reed, J. Diffenbach,
Jas. Bain, J. D. Imboden, Dav. McHardy.
Chas. Staples,

A true copy of the record. FRANCIS A. WALKER, Chief of the Bureau of Awards.
Given by authority of the United States Centennial Commission.

A. T. GOSHORN, Director-General.

[L.S.] J. L. CAMPBELL, Secretary. J. R. HAWLEY, President.

After forty years' experience we offer to the trade our Centennial Screws, patented May 30, 1876, as the best we have ever known.

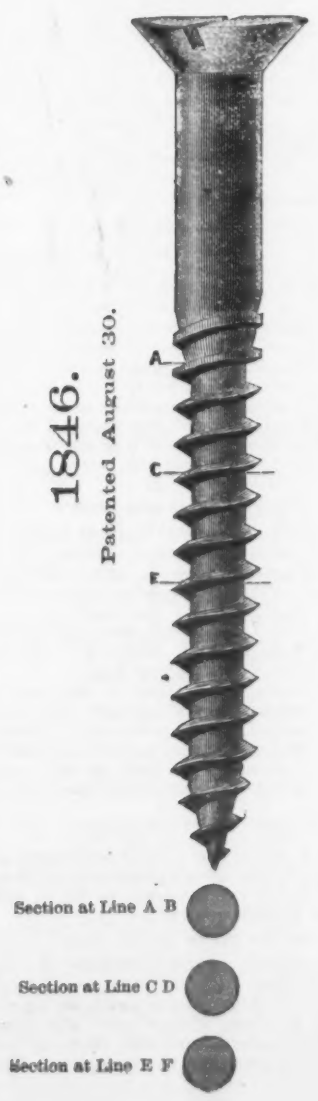
The method of manufacturing is also patented, and we are changing our machinery as fast as possible, to manufacture the improved article only. To introduce them, they will be sold at the same price as the old style screw.

The new screws will be packed in manila colored boxes with the new label covering end of box, and enlarged figures showing plainly contents.

To distinguish this screw we have adopted a trade-mark, which is also secured to us.

The accompanying engravings show the progress of making screw from the old blunt point to style now adopted.

Experience has shown that the wear point of screws, as formerly made, is at the heel of the thread, where all the strains of forcing the screw into the wood naturally concentrate.



To avoid the sharp angle existing in the old style of screws has been the aim of all manufacturers, but every expedient hitherto adopted has proved as objectionable as the evil complained of.

It will be seen in our new screw that not only is the sharp angle avoided, but the strength very much increased, as illustrated. See sections at lines.

CLAIM.

"A Pointed Wood Screw having the outer periphery of the thread upon its body cylindrical, while a portion of the body below the thread and near the neck is conical, the remainder of the body to the point being cylindrical, and yet having all the thread brought to an edge of a constant angle, without jogs in the paths between the threads, substantially as described."

The System of Arbitration.—Address of Mr. Joseph D. Weeks before the Pittsburgh Chamber of Commerce.

Mr. President and Gentlemen: I confess that it is with no small degree of satisfaction that I respond to the very courteous invitation of your Chamber of Commerce, to explain to you the practical workings of trade arbitration in France and England. Few communities have a greater interest than this in the peaceful solution of the questions that vex and harass industrial progress. The securing and continuance not only of peaceful, but of cordial relations between employers and employed, is of the utmost importance. On these depend largely the continued and increasing production of your great staple manufactures, the safety and profit of your invested capital, and, above all, the welfare of that large array of skilled workmen who have here gathered, and whose strength and cunning, united with capital's energy and judgment, have elevated labor, have conserved and multiplied capital and have made these twin cities —"these brunettes of labor," as one of your members has so happily termed them—to occupy a proud pre-eminence among the great centers of American industry.

While the present constitution of industrial society exists, differences will arise between employer and employed. These differences will mainly relate to rates of wages, but not entirely. The relations of employer and employed give rise not only to constantly recurring, but constantly varying questions. There are customs of the trade and the workshop; there are rules which either party may seek to establish in accordance with what it considers its interest, and, justly or not, its right; and there are those questions which that eminent English advocate of arbitration, Judge Kettle, so felicitously terms "matter of sentiment," quarrels concerning which are oftentimes the most senseless, but the most bitter of trade disputes. May I not also say that there are considerations connected with labor and its rights and duties, of a far different and a higher nature than those that can be compassed by buying and selling, and which, of all questions, must not be ignored in a discussion of this character.

Natural law, we are told, will adjust these relations and harmonize these differences. But natural law is slow in its operations, and men may starve and industry be hopelessly crippled while we wait its outcome. Industrial questions demand at times immediate settlement, and for this I know at present but two methods—strikes and lockouts, or arbitration and conciliation. For the first of these methods I know of no advocates. Men who use them condemn them bitterly, and regret the necessity that, to them, seems to demand their employment. They are of themselves no more fit subjects for approving words than wars or pestilence. I do not mean that strikes and lockouts are never justifiable. At times they seem unavoidable, but to adopt them, or to advocate their adoption as an approved method of settling industrial questions, is to invite the aid of powder to quench fire.

The other method is arbitration and conciliation. As a principle it has everything in its favor. It has been adopted in many branches of business to avoid expense and tedious litigation. Arbitration clauses are found in articles of patnership, in policies of insurance, in leases, in building contracts. Why should it not be adopted to avoid those most serious and expensive of litigations, a strike or lockout?

The question, Have arbitration and conciliation been successful in harmonizing the relation of capital and labor where they have been fairly tried? is a very pertinent one just here. I will try to answer this question by showing you what they have accomplished in France and England.

First, however, I should say that arbitration and conciliation are not the same. Arbitration deals with the larger questions of trade, conciliation with the smaller. Arbitration with the whole trade, conciliation oftener with the individuals. Conciliation is not formal; it does not attempt to sit in judgment and decide in a given case what is right and what is wrong, but its efforts are in a frendly spirit, to adjust differences by inducing the parties themselves to agree. It removes causes of dissentions and prevents differences from becoming disputes, by establishing a cordial feeling between those who may be parties to the same. Arbitration, on the other hand, is formal. It sits in judgment. It implies that matters in dispute by mutual consent or by previous contract have been submitted to arbiters, and an umpire whose decision is final and binding on both parties. Bearing this distinction in mind, we can better understand the results that have attended the establishment of boards of arbitration and conciliation in France and England.

Trade arbitration and conciliation had their origin in France early in the present century. The system established was the outgrowth of the trade guilds, which had existed in that country and regulated trade matters in some cases from the Middle Ages. These were abolished during the last days of the monarchy of Louis XVI, a time when the constitution of industrial as well as political society was being overturned. After a few years of imperfect legislation, in 1806, at the request of the workingmen of Lyons and by command of the First Napoleon, courts of arbitration and conciliation were established by law. These, with some slight modifications, have continued until the present under the title of "*Conseils des Prudhommes.*" These councils are judicial tribunals, constituted under authority of the Minister of Commerce, through the chambers of commerce of that country, which are estabilsed at important trade centers. They are composed of an equal number of employers and workingmen members, each class electing its own representatives, with a president and vice-president named by the government.

The authority of these councils extends to every conceivable question that can arise in the workshop, not only between the workman and his employer, but between the workman and his apprentice or his foreman. There is but one question they cannot settle —future rates of wages; but even this can be done by mutual agreement. Arbitration is cumpulsory upon the application of either, and the decisions of the court can be enforced the same as those of any other court of law.

The workings of these courts have been very beneficial to French industry, especially in conciliation. In 1847 the 69 councils then in existence had before them 19,271 cases, of which 17,851 were settled by conciliation in the Private Bureau, 519 more by open conciliation, and in only 529 cases was it necessary to have formal judgment. In 1850, of 28,000 cases 26,800 were settled by conciliation. This is a most satisfactory showing, but it falls far short of expressing the great benefit these councils have been to French industry, especially in removing causes of difference or in preventing them from growing into disputes.

As beneficial as these have been to France, the method is not applicable to this country in my judgment. In the first place, we have not the requisite organizations to carry them out. Again, they do not consider future rates of wages, the most prolific source of labor troubles with us, and in the third place, the compulsory feature seems to be especially obnoxious to both employer and employed.

Though legal and compulsory arbitration and conciliation have been so successful in settling trade disputes in France for nearly a century, they have found no lodgment in England, though a law in some respects similar to the French law has been since 1824, and is to-day, on her statute books. This law, with one passed in 1867 and another in 1872, has not in a single instance, certainly not lately, been used. Arbitration, as practiced in England to-day, is purely voluntary. The boards have no sanction of law nor a legal existence. There is no forced submission, nor is there any power, except a man's sense of honor, public opinion, or the aggregate honor of the unions or employers' association, to enforce the acceptance of the awards, and these have in most cases been found sufficient. This is one of the grandest features of trade arbitration. To see trades of the extent of the North of England iron trade, with their millions of capital and their vast armies of workmen, voluntarily submit their troubles to the decision of reason, and then abide by that decision, is a most happy augury for the future. It is not so difficult to submit a case to arbitration, as there is always a feeling that it is best to yield, or that the case will go in your favor; but when, as in scores of cases has happened in England, the decision has been adverse to the men, to see thousands, forced only by their sense of honor, quietly accept what they have before rejected, is a sight that is fuller of promise than ten thousand victories forced by a strike or a lockout.

The first voluntary permanent Board of Arbitration and Conciliation was established in the hoisery and glove trade of Nottingham, England, in 1860, through the efforts mainly of Mr. A. J. Mundella, a manufacturer, and at present M. P. for Sheffield. The history of the relations of capital and labor in this trade for 150 years before the the establishment of this board, is one of the most disagreeable chapters of English industrial records. It was in this trade that the crime known as Luddism, or machine breaking, had its origin, which, by a special act of Parliament, was made punishable with death, and as late as 1816, six persons suffered this penalty. From this time, though outrages against person and property ceased, strikes and lockouts, with the attendant suffering and consequent bitterness, seemed the normal state of the trade. In 1860 three strikes occurred, the third lasting 11 weeks, and it was at the close of this that the board of arbitration was formed. To prevent an entire lockout of all branches of the trade, upon the suggestion of Mr. Mundella, the workmen were invited to a conference. They came, and after three days agreed to settle the strike in progress and to establish a board of arbitration and conciliation to settle future differences. From that day to this, 18 years, there has not been a general strike in this trade. This board has regulated all the fluctuations of wages since that time. It is a trade in which the articles manufactured are numerous and varied, the wages list comprising over 5000 different prices; the styles are constantly changing, and the vexing question is what shall be the price, as all work is piecework. During these 18 years, while the difficulty has continued, a result has been reached by argument over the table, while capital and labor have both been employed, and not in the streets, while the frames have been idle.

Some three years after the establishment of this board at Nottingham, and without any knowledge of its existence, a board was established in the building trades of Wolverhampton, through the efforts of Mr. Rupert Kettle, a gentleman who devoted 10 years to the establishment of arbitration as a principle. This board differed materially from the Nottingham board. The president was umpire, and was not either an employer or an employee, as in Mr. Mundella's scheme. Mr. Kettle's scheme also provided that the decision of the board should take the form of working rules, which should be the terms of hiring, any violation of which could be punished the same as the violation of any other contract.

The boards of arbitration, as formed in England, embody the best features of both of these systems. While they differ in detail, their main features are the same. They are all voluntary. They are composed of an equal number of employers and employed, each class electing its own representatives. There is in all of the boards a provision for conciliation without convening the entire membership. Regular meetings of the board are provided for whether there is any business to be transacted or not. And in some form or other there is a power to which either party can appeal without pride or shame, that has power to determine as well as to hear, and whose decisions are received without exultation or humiliation. That is an umpire.

To show what arbitration and conciliation have accomplished, let me give a brief account of its workings in the iron and coal trades.

No severer test of the value of arbitration and conciliation can be found than in the circumstances accompanying its workings in the North of England manufactured iron trade. This trade, which includes that of the celebrated Cleveland district, was begun as recently as in 1860. For 10 years its growth was marvelous, and at the end of this time it rivaled many and surpassed most of the older centers of English iron manufacture. This wonderful growth, at a time when other districts were increasing, created a demand for labor that could not be met from the ranks of those already skilled in the various processes of iron manufacture, and workmen were drawn from all classes and grades. The result was a most heterogeneous collection of workmen. There were no ties of friendship or locality. There were none of those attachments that long companionship causes men to form for the very tools with which they work. Endless disputes followed, suspicion was the prevailing sentiment of the workmen for the employers, and these had but little sympathy for their employees. Strikes must result from such a state of things. In 1866 the works were stopped six months. From this time until the winter of 1868–9 there were repeated reductions in wages, and the outlook was that when the time came the men would not be slow to take advantage. Happily, however, trouble was avoided, and in May, 1869, a board was formed, and from that time there has not been a general strike in this district. Under the action of this board, puddling advanced to 13/3, and by an award given only last week, it has been reduced to 7/8. The board of arbitration in this trade at the end of 1875, represented the proprietors of 35 works, and more than 13,000 workmen and 1913 puddling furnaces—not quite half as many as the whole United States. The testimonies to the value of this board, both from employers and employed, are so marked that I ask you to allow me to quote them. I hold in my hand an address delivered before the British Iron Trade Association in 1876, by Mr. B. Samuelson, M. P., in which he says: "It is interesting to find that the employers, in a recent document in the submission of their case for a reduction of wages, most readily record their opinion that, with a few local exceptions which do not affect the general principle, the operators, as a body, have been loyal to the rules of the board—one of these rules being that, in the event of a dispute, the operator shall not abandon his work, but continue his employment pending its adjustment."

I have here a letter from Mr. Ed. Trow, the secretary of the National Amalgamated Association of Iron Workers, an organization that answers to our Amalgamated Association, of which Mr. Bishop is president. The English association, however, is much larger than the American. Let me quote you what Mr. Trow says: "With regard to my views on arbitration, I believe it is the only fair and honorable mode that can be adopted for the settlement of questions between capital and labor; that when both parties meet with an earnest desire for a fair and honorable arrangement, and discuss the various questions in dispute in a kind and conciliatory spirit, there is no fear of failure, but, on the contrary, the old feeling of mistrust and jealousy is banished and confidence in each other is established. The faults in connection with arbitration arise when workmen come to meetings jealous and suspicious, believing that employers are their natural enemies, and employers, by not conversing with delegates in a free and friendly spirit, foster this suspicion, and only through this action is there any fear of failure. Arbitration in England is regarded with great favor by workingmen, and only in a few solitary exceptions has it been refused or its awards rejected by workmen.

"If you wish arbitration to be successful, employers must meet delegates in a kind and conciliatory spirit, so as to gain the confidence of the workmen by proving they only desire full and free discussion, and that no advantage will be taken of men for speaking their opinion. Let this be done, and arbitration will prove successful and be a blessing to employers and workmen."

In the coal trade, arbitration has not been as uniformly successful as in the iron. In the Northumberland trade all disputes were settled by arbitration from March, 1873, to 1877, when trouble arose, since which time arbitration has been abandoned. In the Durham coal district, a much larger one, giving employment to some 50,000 miners, from March, 1872, to March, 1877, all questions were referred to arbitration; at the later date a sliding scale with arbitration was adopted and is still in force. In South Wales, after a strike in 1875 lasting 17 weeks, and involving a loss variously estimated at from three to five million pounds sterling, a conciliation board was established with a sliding scale. After two years' trial a vote was taken to see if it should be abandoned, which resulted in 8934 for abandonment and 18,475 against. There was a minimum rate below which wages were not to go. Three times the miners have consented to a reduction below these rates.

Had I time I could give you the history of its success in other trades, such as the lace, textile, boot and shoe, nut and bolt, nail, iron molding, ironstone miners, quarrying and chemical trades; but this is useless. You have neither the time nor the patience to listen to me. Nor has it been my purpose to dwell at length on the advantages or disadvantages of this system. For these I must refer you to my report made to Gov. Hartranft. I have only endeavored to give you a portion of the facts that came to my knowledge, while I tell you frankly that a large part and a better part of its history cannot be told. The records of conciliation cannot be kept.

And now, gentlemen, let me in conclusion bespeak from you for this subject your careful consideration, and, if possible, your favorable action. Do I overstate the case when I say that the future relations of capital and labor in this great and busy workshop rests with those here present? And can amicable relations be better promoted than by the adoption of this principle as the method of arranging any differences that may arise. In the eloquent words with which that honored citizen of Pennsylvania who has just left the gubernatorial chair closed his last message, when speaking of the future of this State: "To-day it pours over a continent its treasures of coal and iron, of oil and lumber. I believe its true progress lies in extending its industries and educating its laborers. As said last year, the great warfare of the nineteenth century is industrial warfare. In this contest Pennsylvania will enter with unrivaled resources, and wise and liberal legislation ought to give an army of skilled workmen that will win a noble victory."

Strong in the belief that this victory can only be won by the united efforts of capital and labor working with a common energy toward the same purpopse, with reason and not passion as a guide, I present arbitration as a means of bringing about a more harmonious feeling, and of providing a way in which employer and employed may meet to consult and to decide what part each shall have in winning the victory.

I do not claim for arbitration that it is a wonder worker. It is not perfect. It is used by men that are very human, and who under the present condition of things are extremely selfish. For these reasons it will fail to accomplish at times all that is expected. Though it may thus fail, it will in most cases succeed; and under its action, wherever established, an intelligent co-operation between employers and employed will be effected, and steady employment secured at those rates of wages which the industrial conditions of a competitive market enables capital to pay.

As I stated in the beginning of this address, differences between capital and labor will constantly arise in your midst. They are here now. In all three of your great staple industries, iron, coal and glass, there are strikes in progress. It is for you to say how these differences shall be settled, whether by reason or by brute force. Decide you must, and in some cases soon. My only object in all my investigations and in all that I have said or written on this subject is to aid, if I can, in an honorable, reasonable solution of some phases of that most important of all human problems, the labor question. We are greatly in the dark on this subject. I believe we are moving toward the light. When I look back a hundred years and see the gradual brightening of what was then the darkest of all social problems, I have no fears of the result. It may be delayed, but reason will rule and determine the nature of the relations of capital and labor. There are certain facts that we may refuse to acknowledge, and refusing to own may go on in the old way, but the new way of reason and a respect for the rights of each other will win. It will be a day of the greatest promise when in our city we shall put aside the preconceived prejudices and notions of the past, and urge forward social and industrial organization on the basis of reasoning, toward which we are hastening. There can be no nobler or more sacred work for men to do.

Mining and Mineral Items.

COAL.

A very serious cave-in is reported as having occurred at No. 7 colliery of the Pennsylvania Coal Company.

The Massillon, O., coal mines report increased activity in the market, and a larger output than has been known for years. The Pigeon Run mines have started up with over 100 miners.

The Mercer county, Pa., coal mines are, on an average, working to about one-half of their capacity.

The coal bins being erected by the Mineral Coal Co., below the Casmeron Colliery, will have a sufficient capacity to store about 7000 tons coal.—*Shamokin Times.*

The coal trade at New Straitsville, O., is improving.

The Bear Ridge Colliery was advertised to have been sold by the sheriff, by virtue of a writ of *fieri facias*, on October 25th, of last year. The sale was adjourned on the day in question until November 14, then to November 21st, to December 3d, 12th and 18th, of 1878. Then to January 2d and 16th, and now it has been adjourned again.

The Birmingham Coal Co., at Spiketown, Pa., resumed operations on Monday morning, the 20th inst.

The Continental Colliery, in Schuylkill county, Pa., lately purchased by the Lehigh Valley Railroad, will be put into operation on Feb. 1.

The coal mines at McDonald, Pa, are doing a fair business.

The Vermilion Coal Co., at Streator, Ill., are running to their fullest capacity at present. The company are behind in their orders.

The total anthracite tonnage carried over the Lehigh Valley road in the fiscal year ending Nov. 30, 1878, was 3,446,616 tons, and of bituminous, 32,977 tons; total, 3,479,593 tons, or 911,693 less than in the previous year. Notwithstanding this heavy reduction of coal tonnage, the net income was only $208,302 less than in 1877, and amounted to $3,729,095, out of which was paid:

Interest on bonded debt	$1,522,206
Dividends, 4 per cent	1,095,522
General expenses, interest on floating debt, taxes, loss in operating Morris Canal and in coal operations	1,035,658
Total	$3,653,366
Leaving a surplus of	$75,729

added to the credit of profit and loss. The floating debt, less cash on hand, at close of the year, was $686,833. Capital accounts were increased $258,019, mainly used in additional investments in connecting lines. The Ashland branch was completed and opened for business in June, 1878. A gratifying increase in the grain traffic from the West is noted, most of which reaches tide at Port Richmond, via the Philadelphia and Reading Railroad, from Allentown. Hon. Asa Packer was re-elected president, and the same board of directors as before.

The following, from Saward's *Coal Trade Journal*, is the report of coal carried over main line and branches of the Pennsylvania Railroad during the year 1878, in tons of 2000 pounds:

District received from.	Coal.	Coke.
Anthracite	697,744	12
East Broad Top	63,068	.....
Huntington and Broad Top	76,826	.....
Cumberland	167,608	.....
Snow Shoe	29,168	.....
Tyrone and Clearfield	1,270,112	11
Gallitzin and Mountain Region	200,099	5,241
West Pennsylvania Railroad	186,308	80,994
Southwest Pennsylvania R. R.	26,663	786,805
Westmoreland Region	692,585	78,766
Pittsburgh Region	429,438	128,918
D., H. & W. Anthracite	72,440	.....
Lewisburg Anthracite	1,758	.....
Grand total since Jan. 1	3,920,766	1,085,990

In the edition of this journal for the 8th inst., we gave some figures as to the product of the Shamokin portion of the anthracite coal field. We now find the following prepared by J. J. John, which includes all the coal mined:

	Tons.
Sent East by P. & R. R. R.	699,156.12
" " Lehigh Valley	59,316.02
" West by New York Central R. R.	585,781.06
Estimated sales at mines	18,000.00
" consumption at breakers	90,000.00
Grand total	1,452,254.00
In 1877	1,776,163.00

The Chicago, Milwaukee and St. Paul R. R. are said to have made purchase of an interest in valuable coal mines in Mahaska county, Iowa.

IRON.

Messrs. Gorman & Kern will resume mining operations on the lands of Benjamin Eisenhard, near Macungie, Pa., having received an order from the Coleraine Iron Co. for a quantity of ore. The mountain in the vicinity of Macungie is full of mines. No less than 200 to 300 men are at work. The magnetic mines of Lehigh will soon be as well developed as those of New Jersey.

PRECIOUS METALS.

The Ruby Hill (Nevada) *Mining Report* urges the erection, by some well-disposed capitalist, of a $5000 sampling works for the accommodation of that district.

The *News and Courier* gives the product of the Boulder Company ores for 1878 at $713,642.50.

During the past six years the Bald Mountain Company, Sierra county, has paid dividends to the amount of $664,000, which is $110,666 per year. Gold to the amount of $1,300,000 has been taken from the mine in that time.

The Bodie mines were taken up under United States law, and held as from the United States. But now it transpires that the United States did not own the land occupied by many of the chief mines; on the contray, the State owned them, and the United States could not allow any one to hold them either by yearly work or by purchase—in fact, had no claim on them whatever.

Some 35 or 40 miners and prospectors are now engaged on the small rich gold mines of Alabama district, to the northwest of Lone Pine, Cal. Two reduction works are in operation, the yield of fine gold proving the work very profitable. At present, however, the Orion or Schulte mine, one of the largest and first worked, is shut down, owing to the practical impossibility, so far, of separating the fine gold from the iron sulphurets, which seem to be a peculiarity of the mine. Experiments are going on to determine some method of handling them, and it is probable that a small roasting furnace will be put at work.

The Silver Cloud Mining Company has chosen Hamilton Disston, of Philadelphia, president, S. C. Dunham, of Hartford, secretary and Philip Corbin treasurer.

Mining is quite prosperous in Hancock county, Maine. The Sullivan Company recently sold 300 tons of silver ore to New Jersey parties for $70.80 a ton; the Blue Hill copper mine is proving successful, and the gold and silver mine at Sedgwick has been sold to New York parties, who will erect smelting works at quite a cost.

A gold mine has been discovered in East Tennessee.

Electro-Bronzing on Iron and Deoxidized Bronze.

Among the patents for alloys and improved processes for electro-plating, are those of the Philadelphia Smelting Company, corner of Twelfth and Noble streets, Philadelphia. The patents include the process for putting on iron a durable electro-bronze finish, which is claimed to possess the beauty and finish of real bronze at a very much lower cost, and to be wholly unaffected in color, &c., by the action of the atmosphere. This affords a cheap and serviceable method of embellishing ornamental ironwork, as used for railings, cemetery inclosures, hitching-posts, &c., and is rapidly coming into more extended use.

The articles to be bronzed are first put in a bath of paraffine, which stops further oxidation; they are then coated with a metallic substance and subjected to the electro-bronzing bath, after which they are treated with a peculiar protecting varnish, and are then ready for use. In experimenting in this direction the alloy was discovered, called by the company "Deoxidized Bronze," which is claimed to possess in a remarkable degree, all those features for which alloys are especially valuable. It is composed entirely of copper and tin, the peculiarities in the resulting texture being entirely due to the flux used and the method of treatment. It is said to possess superior malleability, approaching gold alloys in this respect, while its tenacity and solidity are very great. Specimens eight or ten inches long admit of being doubled up without apparent injury to the structure. It flows readily, is easily handled by ordinary workmen, and is capable of reworking from old scrap. It is also receptive of a high, smooth finish; wears well, and is largely used for machine journals, car bearings and other purposes of a similar nature where a durable anti-friction metal is required. It is now in use at the Philadelphia Mint, Henry Disston & Sons, Pennsylvania Steel Works, &c., and is claimed to give the best satisfaction.

The Stirling Iron Works.—In an article on the early history of these famous colonial works, published in our issue of December 12, 1878, we erroneously attributed the discovery of the Marquis of Creve-Cœur's work ("Voyage dans la Haute Pennsylvanie et dans l'Etat de New-York") to a Yonkers gentleman. We have since learned, through the courtesy of Messrs. Wheeler & Davis, of the Stirling Chain Works, of Buffalo, N. Y., that the finding of the interesting account referred to was due to the indefatigable zeal, as an antquarian, of Mr. O. H. Marshall, of Buffalo

Cutlery.

FRIEDMANN & LAUTERJUNG,

Manufacturers of

PEN AND POCKET CUTLERY,

Solid Steel Scissors, Shears, Razors, &c.

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"ELECTRIC RAZORS,"

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Agents for the BENGAL RAZORS.

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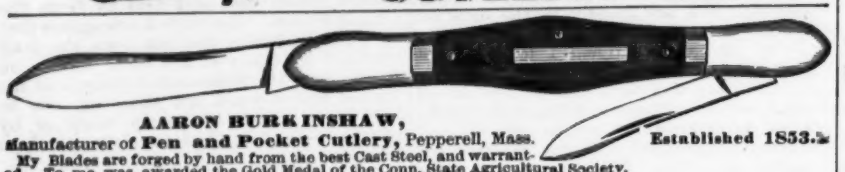

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My Blades are forged by hand from the best Cast Steel, and warranted. To me was awarded the Gold Medal of the Conn. State Agricultural Society. Office in New York with **E. P. Whipple,** 100 Chambers St.

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Manufacturers of FINE PEN & POCKET CUTLERY.

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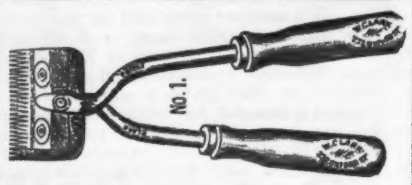

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PATENT HORSE CLIPPER

Five styles. Fully described by our circular and price list, which we will send on application.

The genuine are stamped on both the wooden and metal parts, as shown in the illustration, as a protection against inferior imitations.

All repairs executed with care and dispatch.

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The assortment of Gardner's Celebrated Barlow Knives has been increased, and they are now furnished with Rubber, Bone, Stag and Wrought Iron Handles.

All of Gardner's Patent Knives are fully warranted.

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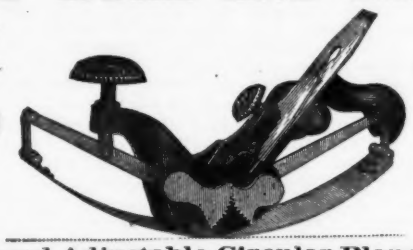

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AGENT FOR

WALTER SPENCER & CO.,

Steel and File Manufacturers.

Rotherham, ENGLAND.

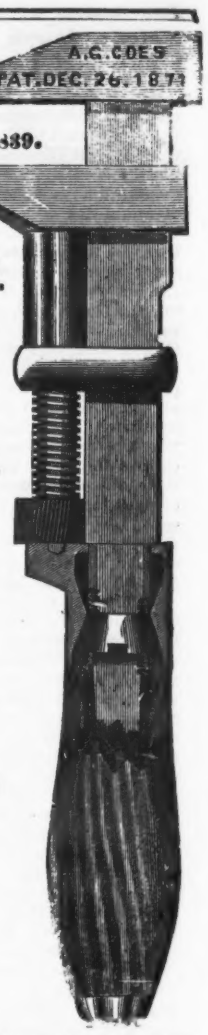
Corporate Mark.

SPENCER ROTHERHAM

Granted 1777.

A.G.COES PAT.DEC.26.1871

Established in 1839.



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WORCESTER,

MASS.,

Successors to

L. & A. G. Coes,

Manufacturers of

THE GENUINE

COES

Screw Wrenches.

PATENTED,

May 2, 1871.

December 26, 1871.

December 28, 1875.

August 1, 1876.

The back strain when the wrench is used is borne by the bar—not by the handle.

The strongest Wrench made, and the only successful Re-enforced Bar.

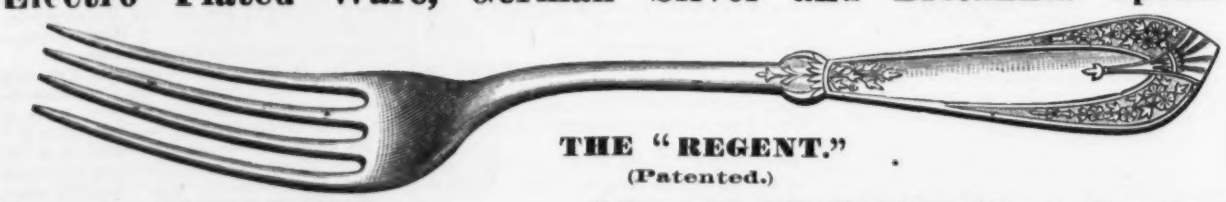
None genuine unless stamped

A. G. COES & CO.,

Our Agents, GRAHAM & HAINES, 113 Chambers St., New York, carry a full line of our goods, and will be pleased to serve you at factory prices.

HALL, ELTON & CO.,

Electro Plated Ware, German Silver and Britannia Spoons.



THE "REGENT."

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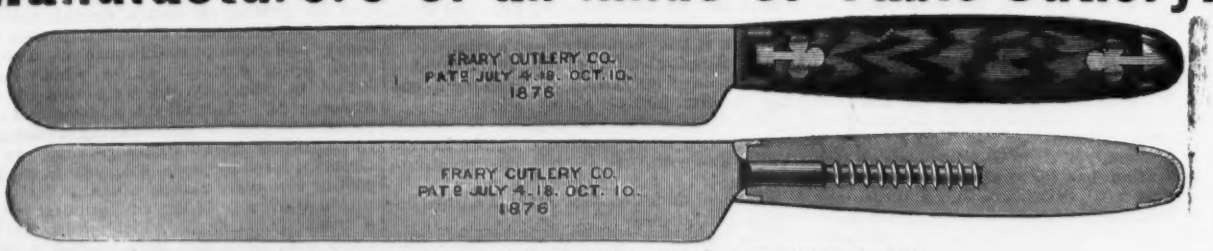
NEW YORK OFFICE & WAREHOUSE, with WIEBUSCH & HILGER HARDWARE CO., 84 Chambers St.

Manufacturers of all kinds of Table Cutlery.



The above Illustrations represent their New Patent Screw Tang Lock Fast Solid Handle Knife.

There is no question but that a solid handle Knife is much more preferable than a scale tang. The great objection to their use hitherto is, that no solid wood handle has been placed on the market with the handle properly secured—no handle put on with cement will stand the wear and tear of every day usage. The cement will expand and contract with the action of heat and cold, and become loose, crack and come off, causing great prejudice against their use. This objection is overcome in our patent screw tang. A wood screw is welded to the tang of the Knife or Fork, and screwed firmly and securely in the handle and locked there by the bolster, making a very strong neat and handsome knife, which we warrant never to get loose, crack or come off. We manufacture a large variety of patterns, both Table, Butchers and Carvers, and furnish the patent handle nearly as low as the scale tang. We are prepared to furnish this line of goods, together with the scale tang and iron handle, very promptly, and very respectfully invite the attention of the trade.

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Simplest

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SASH LOCKS.

No Spring.

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BALL'S PAT. SOLID STEEL SHEEP SHEARS.

These shears are unsurpassed for cheapness, durability and utility. They are made of one solid piece of steel from point to point, and cannot be broken in use either in the bow or at the junction of the shank and blade. Samples can be seen at above address, or sample lots furnished.

PATENT MINERAL WOOL,

Entirely fire-proof, undecaying and the best non-conductor of Heat, Cold and Sound. Used extensively for lining steam pipes and boilers, underground and open-air pipes, water tanks, refrigerators, cold storage houses, roofs and walls of dwellings, drying kilns, deadening floors of railway passenger cars, &c.

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Agency for Barnes' Foot-Power Machinery

Velocipede Scroll Saws, No. 1, $12.00; No. 3, $15.00; No. 4 (new one), $15.00; for fine fret work. Velocipede Scroll Saw, with seat, No. 2, $25.00; and "Large" Saw, $25.00; both for light and heavy carpenter use. Mortising and Molding Machines, each, $25.00. Combined Circular and Scroll Saws, $40.00; with boring attachment, $50.00; Hand Circular Rip Saw, $50.00; for heavy work. Lathes, $35.00, $50.00, $100.00. Sixty-four page catalogue, description of above, given on application. One hundred page catalogue now in print.

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CELEBRATED CUTLERY,

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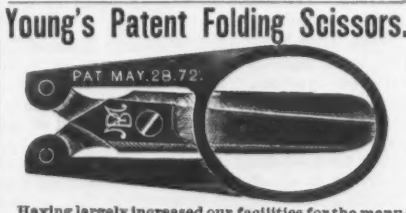
F. & W. CLATWORTHY, Agents.

The demand for **Joseph Rodgers & Sons'** productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam power.

To distinguish Articles of **Joseph Rodgers & Sons'** Manufacture, please to see that they bear our Corporate Mark.

Young's Patent Folding Scissors.



Having largely increased our facilities for the manufacture of these very popular goods, we offer them to the trade at a large reduction from our former prices. The list price of the large size is now $12.00 per dozen, formerly $18.00, and the small size, $9.00, formerly $12.00. The material used in the manufacture of **Young's Patent Folding Scissors** is the very best. All are nickel-plated and furnished with a neat morocco case.

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Warranted made from

S. & C. WARDLOW'S EXTRA CAST STEEL.

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Isaac Greaves' Best Cast Steel

SHEEP SHEARS.

Equal to any in quality and finish, and lower in price. Same numbers, styles and list as Wilkinson's.

We also attach to these Shears the

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of which we have exclusive control. This is a great improvement. It effectually prevents sticking and cutting the sheep, and enables the operator to shear faster and smoother.

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ELEYS BROS.' GOODS, WRIGHT'S ANVILS,
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All sorts of Hardware and Merchandise for import and export purchased on commission.

R. COOK & SONS,

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ESTABLISHED 1859.

W. & J. TIEBOUT,

Manufacturers of

Brass, Galvanized & Ship Chandlery Hardware,

No. 290 Pearl Street, New York.

Production of Copper in Michigan.

We print on this page a complete and detailed table of the production of copper of the famous Lake Superior region, compiled by Mr. Chas. E. Wright, M. E., commissioner of mineral statistics. The figures are given in net tons of 2000 pounds, the totals of the last two columns showing the entire production of every prominent mine from a time previous to 1853 to 1878 inclusive. As it may prove interesting, we give below the totals of every year's production previous to the year 1870, together with the total value in New York city and highest and lowest prices:

Year	Prodtn.	Value.	Price.
Previous to 1855..	6931.5	$3,200,000	29½ @ 16
1855.....	2898.8	1,543,300	29½ @ 24½
1856.....	4102.6	2,215,000	29½ @ 24½
1857.....	4541.0	2,271,000	30 @ 20
1858.....	4398.9	2,240,000	26¾ @ 19¼
1859.....	3903.0	1,798,000	24¾ @ 21
1860.....	5533.0	2,434,000	24 @ 19⅞
1861.....	6992.6	3,077,000	27 @ 17½
1862.....	6882.0	3,579,000	32¾ @ 20¾
1863.....	6477.6	4,425,000	39 @ 29
1864.....	6385.0	3,000,000	55 @ 39
1865.....	6631.6	5,304,000	50½ @ 28
1866.....	6801.9	4,625.000	42 @ 26½
1867.....	8651.0	5.325,000	29¾ @ 21½
1868.....	10759.9	5,182,000	24½ @ 21¾
1869.....	14125.6	6,780,000	27 @ 21½

The Barb Fence Wire Litigation.

The great consumption of barb fence wire, and the prospect of its extensive future employment in the agricultural districts, give a special interest to the results of recent litigation growing out of infringements of the patents under which this article is manufactured. It is probably well known to most of our readers that the Washburn & Moen Manufacturing Company, of Worcester, Mass., and Isaac L. Ellwood, of DeKalb, Ill., are the owners of the foundation patents covering the principle of the barb wire for fencing. The number of patents which have been taken out relating to barb fence wire probably runs up into the hundreds. Of these the parties named own many, some by grant and some by purchase; but most of these are for minor improvements, and do not traverse in their claims the specifications of the original patent. With the growth of the demand for this kind of fence wire, a great many concerns have been tempted to engage in its manufacture. Finding that their rights were not respected, and that unlicensed competition was becoming an important matter, the Washburn & Moen Mfg. Co. and Mr. Ellwood found it necessary to institute legal proceedings against infringers. Suits thus brought have involved large interests, and have extended over some years.

The most important of the suits brought against those charged with infringing were abandoned by the defendants, it appearing, as the suit progressed, that the foundation patents could not be successfully assailed. Some of those manufacturing without licenses have discontinued the business; others are continuing under licenses granted in consideration of a stipulated royalty on the amonnt of their product. Decrees have been secured by the plaintiffs in several suits, which affirm the validity of the Hunt, Smith, Glidden, Kelly, and Glidden & Vaughan patents, and declaring the same to be exclusively vested in the Washburn & Moen Manufacturing Company and Isaac L. Ellwood. The suits thus far decided in favor of these parties have been distributed as follows: Three suits in the United States Circuit Court, District of Connecticut, wherein the Colwell Steel Barb Fence Company and others were defendants; three suits in the United States Circuit Court for the Northern District of Ohio, in which the Ohio Steel Barb Fence Company and others were defendants; three suits in the United States Circuit Court for the Southern District of Illinois, in which Ayres & Decker were defendants; two suits in United States Circuit Court for the Northern District of Illinois, in which the Ohio Steel Barb Fence Company and others were defendants; and two others in the same district, in which the Joliet Wire Fence Company were the defendants. These suits were ably defended by eminent legal talent, and when not abandoned by the defense, were decided upon their merits. The decisions and decrees in these cases seem to place the patents of the Washburn & Moen Manufacturing Company and Ellwood beyond dispute, and there appears to be little probability of any further important litigation growing out of them. In view of the proverbial delays and uncertainties of the law, it may be assumed that the validity of the foundation patents was susceptible of such clear and specific proof as to leave no reasonable grounds of appeal from the decisions of the Circuit Courts.

Labor and Wages.

The Jacobus & Nimick Mfg. Co., Pittsburgh, reduced the wages of their molders when they stopped to take stock some six weeks ago. They notified their molders that a new list would be prepared, which, when presented, was objectionable in one or two items. The difference was but trifling, and the scale was soon arranged satisfactorily and work resumed on the 27th.

Advices from Ashland, Ky., are that the prolonged strike of the Norton Iron Works miners terminated on the 27th ult. by the miners resuming work. A large number of turbulent miners gathered at the works threatening trouble, declaring that the men resuming violated the rules of the union, which required concessions from the mine owners. Following this excitement came a strike among the employees of the Princess Furnace, a few miles distant, the miners demanding an advance of five cents per ton. By this movement several hundred men are thrown out of employment. Great excitement prevails.

The colliery employees, miners and laborers of the Reading Coal and Iron Company, through their delegates, have notified President Gowen that they will quit work February 15, unless the company pay "each month's wages in lawful money of the United States, on or before the 15th day of the month succeeding."

The following prices are paid for mining on the Pan-handle road, Western Pennsylvania: Primrose, W. P. Rend's and Briar Hill working for 65 cents per ton. Nobles-town is on strike. Cherry mines started to work on Monday, January 20, at 3 cents per bushel; also Huntsman & Miller's. Camp Hill was working as usual. Bell's bank is, we believe, working for 65 cents per ton.

The following prices are paid for coal mining on the Chartiers Valley road, Western Pennsylvania: McCabe, Clark & Co.'s miners held a meeting on Friday, January 16, and decided to stand for 3 cents per bushel, but on Saturday some 18 or 20 agreed to go in on Monday, January 20, for the usual price, 2½ cents per bushel. Bower Hill is still working at 3 cents, we believe. Summer Hill received 3 cents. Nixon's mines were working for 2½ cents. Glendale received 3 cents on Monday, January 20.

The miners of the Pan-handle and Chartiers Valley railroads were to meet by delegate at Mansfield, Pa., yesterday, at 10 o'clock, for the purpose of devising ways and means to secure the price at 3 cents.

The miners employed at the coal works at Hastings' Station, Pa., have resumed work at three cents.

The coal miners at Helling's mines, Martin's Ferry, Ohio, who asked for an increase of wages, have concluded to go to work at the old prices.

The men in the lower lift at the St. Nicholas, Schuylkill county, Pa., colliery are still on strike against a reduction of 75 cents a yard, which brings down the price to $7.

The Barnesville, Ohio, miners gained their strike and went to work last week.

Quite a number of the iron manufacturing firms of Pittsburgh have made reductions in the wages of their employees since the close of the old year, the reductions amounting to from 10 to 25 per cent, but in most instances not over 12 per cent. They have tried for a long time, but unsuccessfully, to put prices up, failing in which there seemed to be no other way to "make ends meet" than to put wages down.

It is stated that boiling is being done at some Western mills at $4.

The amalgamated iron workers held a district meeting Saturday. The business done has not transpired, but it is supposed to relate to wages.

The German Tariff Question.—Prince Bismarck recommends a return to the Prussian customs legislation of 1818, and the tariff system of the Zollverein valid up to 1865. How this policy will affect English iron and other products need not be pointed out. The Prince concludes: "A return to the principle of universal tax liability suits our present commercial and political circumstances. After the failure of an attempt to arrange a new tariff treaty with Austria-Hungary, irrespective of the prolongation of that heretofore existing, we have become free, apart from certain stipulations with Belgium and Switzerland, to modify our customs tariff to our own mind, and in the impending revision of the impost scale, our own interest can be our only guide. This interest will, perhaps, lead to fresh negotiations with foreigh countries for tariff treaties; but if these negotiations are to be entered into with any prospect of success for Germany, it is necessary for us previously to take an independent course, and create such a customs system as shall place our home products in the most favorable position possible with regard to those of other countries."

STATISTICAL TABLE OF THE PRODUCTION OF COPPER IN MICHIGAN (LAKE SUPERIOR) FROM 1870 TO 1878 INCLUSIVE.

By Chas. E. Wright, M. E., Commissioner of Mineral Statistics.

County.	Names of Copper Mining Companies.	1870		1871		1872		1873		1874		1875		1876		1877		1878		Totals.	
		Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.
1	Adventure	1	0931	3	0391	8	1055	2	1345	3	165	15	470	20	784	32	609	27	115	566	1638
2	Ætna	....	....	....	....	....	....	2	650	....	....	....	....	....	....	....	....	....	....	70	881
3	Albany and Boston	....	....	....	....	....	....	33	200	....	....	....	....	3	15	5	1998	....	1746	440	36
2	Allouez*	....	....	....	....	....	....	10	1163	504	134	692	1574	780	1875	650	279	493	796	3,133	1396
2	Amygdaloid	23	1610	....	....	....	....	14	250	7	1840	....	....	....	....	....	....	....	1259	770	1180
3	Arcadian	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	409
3	Atlantic (South Pewabic)	186	617	....	....	....	....	431	1366	686	406	783	1036	917	1041	1,019	1226	1,021	1873	6,641	587
1	Aztec	12	1288	6	1153	5	1550	....	....	6	1412	8	252	13	1378	14	1934	11	1392	340	1240
2	Bay State	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	199	1115
1	Caledonia (Old Nebraska)†	43	1508	1	1377	....	....	....	....	....	....	....	....	....	....	....	....	....	....	131	688
3	Calumet and Hecla	7,030	1584	8,111	590	8,081	1836	9,424	265	10,062	1225	10,736	1954	10,845	737	11,284	468	12,537	782	97,497	760
1	Carp Lake	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	15	1135
2	Central	663	1156	716	662	623	56	751	1117	870	900	733	952	1,080	1400	997	1610	945	1013	12,597	1941
2	Clark	....	....	....	....	8	1749	....	....	3	1244	33	1475	19	774	17	813	10	1520	93	1575
2	Cliff	....	....	71	238	59	386	375	1203	526	901	581	873	450	146	80	1319	207	415	18,622	1226
3	Concord	4	1815	61	1626	71	1792	61	168	11	518	....	440	....	....	....	....	....	....	327	1544
2	Copper Falls	386	990	239	883	260	862	643	540	535	359	203	1587	8	1488	5	1950	5	1790	6,750	1512
2	Delaware	....	....	....	....	81	1161	140	743	40	1271	12	1220	88	1701	16	1417	140	345	601	1050
3	Douglass	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1258	....	....	84	1502
2	Eagle River	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	24	1667
1	Evergreen Bluff	55	1420	22	1048	....	....	....	....	....	....	....	....	....	....	....	....	35	1873	409	1833
1	Flint Steel River	15	889	46	500	22	1879	38	698	24	772	16	1054	15	115	13	67	19	356	377	1046
3	Franklin	589	....	300	1000	186	....	183	....	283	1790	583	800	963	641	1,169	1817	1,178	172	11,500	914
2	Garden City	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	37	1397
3	Grand Portage	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	17	124	797	209
3	Hancock (Sumner)*	203	1731	29	1710	27	366	44	1132	30	1365	14	229	....	....	....	....	....	....	1,398	7
1	Hilton (Ohio)	1	1345	....	....	....	....	....	....	....	....	....	....	....	....	1	1555	3	807	20	1769
3	Houghton (Huron)*	42	183	134	1453	276	1689	237	1883	125	1005	31	1289	31	1857	41	161	32	1100	3,797	386
1	International (Bohemian)	4	630	9	1482	32	1100	50	845	3	1535	4	762	5	653	8	1703	....	1488	216	58
3	Isle Royale*	....	....	90	1217	125	164	120	100	90	876	48	682	14	199	15	1985	15	1933	4,485	829
4	Island	....	....	....	....	....	....	....	....	....	....	....	....	24	340	44	867	....	....	68	1207
1	Knowlton	....	....	....	....	8	1559	35	442	3	215	3	562	....	....	2	1975	4	629	263	973
1	Lake Superior	....	....	....	....	....	....	....	....	2	1228	....	....	....	....	1	106	....	....	6	1735
2	Madison (Summit)	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1676	35	557
1	Mass	1	1408	9	602	....	1903	4	265	5	1925	1	1014	40	1952	54	238	148	1634	340	543
3	Mesnard	....	....	....	....	....	....	4	1269	....	....	....	....	....	....	3	589	....	....	42	97
1	Minnesota	200	1500	184	....	126	....	74	171	93	338	66	1419	44	954	56	1148	87	1027	17,263	996
4	Minong	....	....	....	....	....	....	....	....	....	....	24	344	57	537	52	892	45	596	179	369
1	National	130	660	205	1086	168	770	83	1870	71	52	49	878	83	647	34	737	11	736	5,165	732
1	Nonesuch	....	....	....	257	....	....	....	....	13	1450	24	1667	....	....	....	....	....	....	42	137
2	North American	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	976	1804
2	Northwestern	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	199	213
1	Norwich	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	496	1360
1	Ogima	....	....	4	1830	....	....	....	....	....	....	....	....	....	....	....	....	1	800	460	345
1	Ohio Trap Rock	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	20	1185
3	Osceola	....	....	....	....	....	....	....	....	468	....	665	303	846	1737	1,382	777	1,223	1700	4,586	517
2	Pennsylvania (Northwest)	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1,517	302
2	Petherick	....	....	....	....	5	570	6	1348	86	291	76	946	42	1224	7	633	....	....	343	424
3	Pewabic	480	409	273	....	222	600	233	1000	147	607	312	1271	284	995	346	1777	261	1826	10,643	1314
2	Phœnix	499	1090	609	1862	364	470	260	1080	699	400	702	276	698	530	511	493	150	1172	5,763	1340
2	Pittsburgh and Boston ‡	404	1071	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	994	1138
3	Quincy	1,248	1777	1,204	1501	1,134	1134	1,400	....	1,525	654	1,399	281	1,536	1171	1,427	336	1,480	449	23,175	675
1	Ridge	122	1400	175	150	128	1910	115	1140	187	113	164	447	145	18	148	815	125	1837	1,956	953
1	Rockland	47	1000	30	....	25	1000	11	1400	22	1260	5	1440	28	1600	19	700	8	1877	3,104	385
3	Schoolcraft*	213	366	371	1228	192	242	154	1785	5	618	....	....	....	....	....	....	....	....	941	529
2	Seneca	...	....	....	....	...	1603	....	....	....	....	....	....	....	....	3	1810	3	1809	8	1222
3	Shelden and Columbian	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1622	673	463
4	Saginaw	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1800	....	....	....	1800
5	Star	....	....	....	....	....	535	....	....	....	....	....	....	....	....	....	....	....	....	8	1180
2	St. Clair	....	....	....	....	9	72	40	1867	2	1400	....	....	....	....	....	....	....	....	220	939
1	Superior	....	....	....	....	....	....	....	....	....	....	....	....	1	1936	2	1870	....	1965	282	1855
1	Toltec	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	206	1433
1	Victoria (Forest)	1	1570	1	1903	....	1890	....	....	....	....	....	....	....	752	....	861	2	52	186	1279
1	Windsor	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	34	....
	Sundry Co.'s and tributers	84	....	8	....	5	1220	2	800	16	1120	24	....	41	1800	27	1000	2	186	873	1148
	Total No. net tons and pounds	12,700	1948	12,923	1749	12,265	1123	14,993	105	17,166	1389	18,019	1497	19,135	997	19,505	1593	20,266	492	253,035	659
	Total value (New York City)	$5,334,000		$5,945,000		$8,390,000		$8,996,000		$7,553,000		$8,109,000		$8,033,000		$7,408,000		$6,628,000		$123,394,000	
	Highest and lowest price	22¾—19		27¼—21¼		45—27¼		35—20		25—19		23½—21½		23—18¾		20⅜—17½		17½—15¾			

1. Mine in Ontonagon County.
2. Mine in Keweenaw County.
3. Mine in Houghton County.
4. Mine in Isle Royale County.
5. Mine in Houghton and Keweenaw Counties.
* May 1 of following year.
† Consolidated with the Flint Steel River.
‡ Sold to Clift Co.

Three More Railroads.

The signs of the times have shifted. Let us see what we see:

In Arizona it is evident that they are building the Southern Pacific Railroad from the west end. It is well known also that both the Denver & Rio Grande and the Atchison, Topeka & Pacific Railroad companies, which have been building energetically southwestward, have, both of them, vitality enough to reach the western boundry of New Mexico in due time. The connecting route is the present freight route from the East to Tucson. It will continue to be such only a very short time, for San Francisco will tap the Tucson trade and will have all of it, until the Eastern people reach out for it, just as we are doing, with an iron road.

The Northern Pacific people have let contracts for building a section that will bring them up speedily to the Rocky Mountains from the east end. The great wheat plains of Eastern Washington, which shipped the past year more than their million bushels of wheat, are well known to be rapidly extending their plowed acreage, but the country has no railroad. The Northern Pacific survey runs through those wheat fields for several hundred miles. Does anyone imagine that the Northern Pacific Railroad Company is so dead at the present time as not to be able to build that part of their road under such conditions? If so, he will probably live to learn that a portion of the grain crop for the present year, and all of it for the next, in the upper Columbia country, will be moved by the Northern Pacific Railroad. The route surveyed last season between the Upper Columbia and the Wilkeson branch to the Mount Rainier coal region was found satisfactory; and that connection will be made as the next step, taking the statement of superintendent Black as our evidence of the intentions of the company.

It is not generally known nor understood that the Canadian Pacific Railway is in progress of construction at Winnipeg, and that the Canadian ministry have procured a large loan in England, the object of which is understood to be the building of the railway. Every foot of the line has been located by location survey on a most advantageous route, after surveying some 30,000 more miles on other lines for making comparisons of routes and getting the best. The Canadian premier, Sir John McDonald, represents the city of Victoria, and the policy of beginning construction immediately at the western end and carrying it on simultaneously with construction at the eastern end.—*Mining and Scientific Press.*

Condition of the Furnaces in the Allegheny Valley.—Reynolds & Moorhead's furnace at Red Bank is stopped permanently. This firm is carrying some 18,000 or 20,000 tons of iron. F. B. & A. Laughlin, of the Ore Hill furnaces, are running full time, with no prospect of stopping. They have on hand about 7000 tons. Colwell's Mahoning furnace stopped during the summer, and has blown out permanently. Brown & Mosgrove's Pine Creek is still running. They have sufficient stock on hand to run until late in the spring, when they propose to blow out. They have a large stock of metal on hand. The Cowanshannock furnace at Monticello has been sold out by the assignee of McKnight, Porter & Co., and dismantled. The Brady's Bend furnaces have been dismantled also. The rolling mill at Kittaning has been lying idle for some time, going to ruin for want of enterprise and capital sufficient to carry it on. The mills at Apollo and Leechburgh are both running full turn. By the present outlook Laughlin's will be the only furnace in operation after this spring.

The New Nickel Process.—Messrs Boynton, Wilder & Co., 234 Water street, New York, send us a sample of very satisfactory nickel-plating on sheet zinc by their new process. An accompanying memorandum informs us that the deposit was made in eight minutes. In a circular describing the process, Messrs. Boynton, Wilder & Co. say: We take pleasure in calling your attention to the fact that we have for sale a solution for a process of nickel-plating which we recommend for the following reasons: 1. It is a solution of the cyanide of nickel and potassium, consequently is not a solution which is used and prepared by the alleged Adams process. 2. It will plate on all metal directly, including zinc, lead and solder, and penetrates deeply into the pores of the cathode, thereby preventing oxidation. 3. It will positively plate three times faster than any known process. 4. It never requires a special regulation by electricity, thereby preventing the burning of the smallest articles by the strongest currents. 5. Articles to be plated never become injured from oxidation in the solution. 6. It produces a coherent, tenacious and flexible deposit, superior to any known to science. 7. No acid dips are required for any kind of work, while Dr. Adams claims that acid dips are very essential for good results. 8. The expense of keeping the solution in perfect working order does not exceed $5 per hundred gallons per month if ordinary care is used, as in all other solutions. We are prepared to sell this solution on favorable terms, thereby dispensing with the license or royalty business.

Enameled Hollow-ware.—Messrs. Cribbin, Sexton & Stoddard, of the Elastic Enameling Works, Chicago, have just introduced an improvement in enameled hollow-ware which possesses many excellent features. It has a very thin, vitreous enamel of gray color, which is applied directly to the surface of the iron. It seems to penetrate its pores to some extent, for its adhesion is much closer than that of ordinary enamel, and it does not chip or star when struck sharply with a hammer or sharp instrument. The makers assure us that this enamel is insoluble in water or any of the acids except those which dissolve glass, and that it is entirely free from any dangerous ingredient whatever. We do not know its composition nor the method of its application, but the latter seems to secure the best results attainable with an enamel on iron. Messrs. Cribbin, Sexton & Stoddard have a foundry at Chicago, in which they employ 60 molders in the manufacture of this kind of hollow-ware. They have a capacity for double their present production, which they expect to need as soon as the goods are generally known to the trade.

Frankfort-on-the-Main, now containing a population of about 100,000, is reputed to be the richest city of its size in the whole world. If its wealth were equally divided among its inhabitants, every man, woman and child would have, it is said, 20,000 marks, or some $5000 apiece. There are, as may be supposed, a good many very poor people in the town, but the citizens are, as a whole, in unusually comfortable circumstances; more so, probably, than the citizens of any other capital in Germany or Europe. It is asserted that there are 100 Frankforters worth from $4,000,000 to $5,000,000 each, and 250 who are worth $1,000,000 each and upward. The city is one of the great banking centers of the globe. Its aggregate banking capital is estimated at

$200,000,000, more than one-fourth of which the famous Rothschilds, whose original and parent house is there, own and control. The annual transactions in bills of exchange are in excess of $100,000,000. Its general trade and manufacturing industries have greatly increased since the formation of the German empire, to which Frankfort was originally averse, being a free city and an opponent of Prussia until coerced, in July, 1866, by Gen. Von Falkenstein, who entered at the head of the army, and imposed a fine of 31,000,000 florins for its insurbordination.

Scientific and Technical Notes.

Mr. Seth Green makes a very interesting communication to the daily papers on the possibility of

REARING BLACK BASS.

He states that black bass can be hatched, but does not think the puny fish would prosper, after hatching, for it is just then that they need a mother's care. If he were not pretty positive on this point, that maternal care is one of the necessities for hatching black bass, he should have been hatching them long ago. All fish making their nests and casting their eggs in fixed places, the spawners lying over the eggs as it were, fanning them with their tails, are imbued with the instinct of caring for their young. If all fish were hatched the same way, there would be no need of hatching any fish artificially. Now, here is something quite remarkable. Fish that are tended by the mother have no yolk-sack, and it is the mother who teaches them how to feed; while fish that require no mother have a yolk-sack that will support them when young from 6 to 40 days. By the time the sack is absorbed they know how to take care of themselves, or have learned how to feed.

Prof. Tyndall has just communicated to the Royal Society the results of some further experiments bearing upon the question of

SPONTANEOUS GENERATION

made on infusions boiled in flasks, afterwards hermetically sealed. He took with him to the Alps last summer 100 tubes of infusions, 50 containing turnip and 50 containing cucumber infusion. They were prepared at the laboratory of the Royal Institution, and boiled for five minutes. Twenty flasks were broken in transit. The 80 remained pellucid, and the 20 were turbid with organisms. A number of the 80 flasks had their ends opened in air in which sawdust had been shaken up, and all were soon turbid. Another set were infected by water of a cascade derived from melting snow, and in three days were thickly charged with organisms. Another set were opened in pure air, and remained transparent.

According to the *Zeitschrift f. Anal. Chemie*, H. Borntraeger has discovered an

INDICATOR FOR ALKALIMETRIC WORK,

with such liquids as are colorless and contain ammonia compounds. He extracts fresh-cut orange peel, with a small quantity of absolute alcohol, for 24 hours, and purifies it by shaking with ether. A heavy yellow liquid will be found under the ether, which may be used as an indicator. Mixed with water, it yields a colorless liquid, which remains unaltered in the presence of acids, but assumes a fine yellow color when acted upon by alkalies.

A patent, taken recently in Germany by F. Schmid, of Neustadt-Magdeburg, on a

NEW SYSTEM OF EXHAUST VALVES FOR STEAM ENGINES,

is pronounced by *Dingler's Poly. Journal* to embody an idea which may prove of great consequence. The admission valves alone are actuated from without by flat slide valves, moved by geared segments, while the exhaust is effected by two valves placed at the two cylinder covers, which are so connected with a double-armed lever placed in the exhaust passage, that when the one valve is closed the other is opened. If, therefore, one exhaust valve is closed by the steam pressure, the other is opened to the exhaust steam, until the steam enters on the other side of the piston, which causes the latter valve to close immediately, while the other is opened full.

Glass Items.—The Central Glass-House, Wheeling, is running about two-thirds time, but will commence running full time shortly. ——Eight pots at the Buckeye Glass-House, Martin's Ferry, O., were broken in one week, in consequence of which many of the employees have been idle for a few days. ——Of the nineteen window glass factories in Pittsburgh, fifteen are in operation.

The Vermont Emery Wheel Company at West Charleston, recently received orders for the largest pair of emery wheels ever made in their factory. They were 3 feet in diameter and 4 inches thick.

Special Notices.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, Feb 5, 1879.

During the past week the tone of the financial markets has been healthy and firm, reflecting the growing confidence which is felt in all departments of trade. Since our last issue the sales of 4 per cent. bonds have been sufficient to justify the Treasury Department in calling $20,000,000 more 5-20 6 per cent. bonds for redemption.

The month of January closed with subscriptions for United States 4 per cents amounting to about $160,000,000, against which the Secretary of the Treasury called in $150,000,000 of 5-20s. Of the bonds called, it is estimated that 30 per cent., or say $45,000,000, are held in Europe; but against this item must be set off $10,000,000 of the 4s taken by the new Syndicate for sale in London and on the Continent; leaving a balance of $35,000,000, which, so far as now appears, will have to be paid to European bondholders. Of the 5-20s uncalled, there are now outstanding $198,000,000. After these issues have been replaced by the new 4s, there will remain $282,000,000 of the 6s of 1881 and $195,000,000 of the 10-40s, both of which will be subject to refunding into 4 per cents. under the funding bill which has just become law. It is hardly likely that any really serious obstacle to the refunding process can arise from the calling in of bonds held abroad, for it may be safely assumed that a moderate amount of the 4s will be placed in Europe, and the large excess of exports over imports may be trusted to cover the remaining balance, even though the creditor commercial balance should be less this year than the $300,000,000 that accrued in 1878. So far as the home money market may affect the refunding process, nothing apparently is to be apprehended, for until the fall crop movement, it is likely we shall have a continuance of the low rate of interest which has so long prevailed in the open market. During the past week the rate on call loans has been 1½ @ 2 %. The discount rate on prime mercantile paper is 3 @ 5 %.

The market for government bonds is strong for the long date issues and, in view of the rapidity of refunding, weak for the short date.

Railroad investments are strong. We give below the closing quotations of governments.

The stock market has been very active, with the fluctuation usual when speculation is stimulated. The principal dealings have been in Northwest, Lake Shore, D., L. & W., Erie, New Jersey Central and Western Union. We give below the closing quotations of active shares.

The bank return shows an increase of $591,300 in surplus reserve, which now stands at $17,877,300, against $16,016,775 at this time last year, and $23,837,275 at the corresponding period in 1877. The loans show an increase this week of $3,825,200; the specie is up $1,201,600; the legal tenders are augmented $449,200; the deposits other than United States are increased $4,238,000, and the circulation is down $131,000.

The following is an analysis of the bank totals of this week compared with that of last week:

	Jan. 25.	Feb. 1.	Comparisons.
Loans.....	$234,416,200	$238,241,400	Inc. $3,825,200
Specie.....	17,431,700	18,633,300	Inc. 1,201,600
Legal t'nd'rs	53,599,600	54,048,800	Inc. 449,200
Tot. reserve.	71,031,300	72,682,100	Inc. 1,650,800
Deposits....	214,981,200	219,219,200	Inc. 4,238,000
Reserve required....	53,745,800	54,804,800	Inc. 1,059,500
Surplus....	17,286,000	17,877,300	Inc. 591,300
Circulation.	19,617,600	19,486,600	Dec. 131,000

The foreign trade movements for the week are shown in the following tables:

IMPORTS.

For week ended February 1:

	1877.	1878.	1879.
Total for week.	$6,495,787	$6,923,815	$6,473,409
Prev. reported..	23,082,492	20,630,666	17,712,435
Since Jan. 1....	$29,578,279	$27,554,481	$24,185,884

Included in the imports of general merchandise were articles valued as follows:

	Quantity.	Value.
Anvils	343	$2,716
Brass goods	14	1,424
Bronzes	5	351
Chains and anchors	3	105
Cutlery	107	23,456
Gas fixtures	1	362
Guns	54	10,576
Hardware	4	130
Iron, pig, tons	152	1,906
Iron, ore, tons	985	1,615
Iron, other, tons	1,508	37,321
Metal goods	157	14,517
Needles	17	6,909
Old metal		925
Platina	1	147
Plated ware	2	59
Percussion caps	33	5,012
Steel	183	3,571
Silverware	7	896
Tin, bxs.	5,025	24,066
Tin, 1701 slabs	185,120	27,409
Wire	5	3,137

EXPORTS, EXCLUSIVE OF SPECIE.

For week ended February 4:

	1877.	1878.	1879.
For the week...	$6,522,846	$6,424,239	$7,602,133
Prev. reported..	22,389,752	24,475,621	19,883,072
Since Jan. 1....	$28,912,598	$30,899,860	$27,485,205

EXPORTS OF SPECIE.

For week ended February 1:

Total for the week	$97,625
Previously reported	1,140,292
Total since January 1, 1879	$1,237,917
Same time in 1878	1,555,946
Same time in 1877	1,199,977
Same time in 1876	2,353,836
Same time in 1875	11,072,317
Same time in 1874	3,195,160
Same time in 1873	8,243,182
Same time in 1872	1,540,301

Government bonds at the close were quoted as follows:

	Bid.	Asked.
U. S. Currency 6's	121	122
U. S. 6's 1881 registered	106⅛	106⅜
U. S. 6's 1881 coupon	106⅜	106⅝
U. S. 6's 1867 reg	102⅛	102¼
U. S. 6's 1867 cou	102¼	102⅜
U. S. 6's 1868 reg	102¾	103¼
U. S. 6's 1868 cou	103¼	103½
U. S. 10-40 reg	102⅜	102⅝
U. S. 10-40 coupon	105¼	105½
U. S. 5's 1881 registered	104⅜	104⅝
U. S. 5's 1881 coupon	104⅜	104¾
U. S. 4½'s 1891 registered	104⅞	105
U. S. 4½'s 1891 coupon	106⅛	106¼
U. S. 4's 1907 registered	100	100⅛
U. S. 4's 1907 coupon	100	100¼

The following are the closing quotations of active shares:

	Bid.	Asked.
Atlantic and Pacific Telegraph	37⅛	38
Canada Southern	55	56⅛
Chicago and Northwest	60¾	60¾
" " Pref	84½	84⅝
Chicago, Rock Island and Pacific	126½	127
Chicago, Bur. and Quincy	116¾	117⅛
Col., Chicago and Ind. Central	5⅛	5⅜
Clev., Col., Cin. and Ind	42⅜	42¾
Cleveland and Pittsburgh	93⅛	93½
Chicago and Alton	84½	86
" " " Pref	108	110
Canton	28	30
Delaware, Lack. and Western	50	50⅛
Delaware and Hudson Canal	39	39⅛
Express—Adams	106	106½
" American	48½	49
" United States	47¾	48½
" Wells, Fargo & Co	97½	98
Erie	24⅞	24¾
Erie preferred	48	48½
Harlem	147	..
Hannibal and St. Joseph	15⅛	15⅜
" " Pref	38½	39¼
Illinois Central	86½	87½
Kansas and Texas	6½	6⅝
Lake Shore	70⅞	71
Michigan Central	87½	87⅝
Morris and Essex	83	83¼
Milwaukee and St. Paul	39¼	39⅝
" " " Pref	81⅛	81¼
New York Central	115¼	116
New Jersey Central	41⅛	41⅜
Ohio and Mississippi	10⅜	10⅝
" " " Pref	30	32
Pacific Mail	12½	12¾
Panama	126	..
Pittsburgh and Fort Wayne	105	106
Quicksilver	13	15
" Pref	32	33¼
St. Louis and Iron Mountain	15⅛	15½
Sutro Tunnel	3½	4
Union Pacific	63¼	64½
Western Union Telegraph	99⅛	99¾
Wabash	22	22¼
Home Mining	24½	24¾

GENERAL HARDWARE.

In some quarters we hear of a fair demand for seasonable goods, but the general report of the market for the week is that business has been rather quiet. A few out-of-town buyers have visited the city since our last writing. The changes in values reported have been only of a trifling nature.

The demand for Nails continues light, at unchanged figures. We continue our quotation of $2.10 to $2.15, net, for 10d. to 60d.

A new line of Bit Braces has been placed on the market by the New York Brace Company, No. 99 Chambers street, which are offered to the trade at the following net prices:

New York Brace.

		Per doz.
No. 8, 8 inch Sweep	Net,	$5.00
" 10, 10 "	"	5.50
" 12, 12 "	"	6.00
" 18, 8 " with Ratchet attachment	"	10.00
" 20, 10 " " "	"	11.00

Cutting Thumb Screw Brace.

No. 28, 8 inch Sweep	Net,	$4.00
" 30, 10 "	"	4.50

Henry Disston & Sons, Philadelphia, show in their advertisement on the 33d page a list of all the goods manufactured by them. They do this for the reason that being known all over the world as manufacturers of Saws, the fact that they are also manufacturers of a large assortment of Mechanics' Tools, &c., which enter into the stock of every Hardware dealer, is apt to be forgotten.

We have received the following circular:

OFFICE OF THE KEYSTONE SAW, TOOL, STEEL AND FILE WORKS,
Front and Laurel streets,
PHILADELPHIA, Feb. 4, 1879.

To the Wholesale Hardware Trade.—GENTLEMEN: We consider the present is a fitting time to call your attention to the rule which we have established regarding the prices at which our goods shall be sold, and in all cases which come to our knowledge where parties sell our goods at better than the established rates we will adopt the means in our power to prevent its recurrence.

The rates which we have adopted for the distribution of our goods for the current year are as before, viz.:

Parties "east' of the line of Pittsburgh and Buffalo will be required to sell goods at a discount not greater than 20 per cent.

Parties "in" Pittsburgh and Buffalo and "west" of the line will be required to sell goods at a discount not greater than 17½ per cent.

This rule has worked well, and to the advantage and profit of the trade, but it having come to our notice that there is a growing disposition to cut prices, which, if not stopped, will work to the injury of the whole trade, we again assert our intention of using every means to put a stop to cutting of prices on our goods.

We have no desire to appear arbitrary in this matter, but we do wish to see the trade who take an interest in our goods not compelled to meet foolish competition, and handle our wares without profit, and we ask all our friends to aid us to this end by reporting any house that may be detected in violating our rule. *We will guarantee to apply the remedy.* Yours truly,

HENRY DISSTON & SONS.

In addition to the above, they have issued a circular to users of Saws, &c., informing them that in future they will not sell at retail at the factory, Hand-saws, Files and goods of that class; they recommend such users to buy their goods at the retail Hardware Stores, where they can be obtained at the same prices as charged by them, thereby saving the purchaser the cost of boxing and freight.

The Kimball Shovel Co., Baltimore, Md., on the 1st inst. reduced their price on Kimball's Solid Cast-Steel Shovels and Spades to discount 40 per cent. They say: "This reduction brings them as low as any first-class Plated Shovel, and lower than any made of Solid Cast-Steel." Hundley & Hanks, No. 79 Reade street, have been appointed agents for the sale of their goods in this city.

Sargent's Patent Snaps have been reduced to discount 66⅔ and 10 per cent. for prompt cash. The list remains as before.

We have received the following letter:

THE HARDWARE BOARD OF TRADE, LIMITED,
4 and 6 Warren street,
NEW YORK, Feb. 4, 1879.

To the Editor of the Iron Age.—DEAR SIR: I desire to inform you that the Board of Directors of this company have this day elected Mr. John C. Cook, of the metal house of Bruce & Cook, as its president, in place of Mr. George S. Corbin, who has resigned on account of his being obliged to leave the city for a time.

I am, very respectfully yours,
JAMES H. GOLDEY, Actuary.

The attention of Hardware dealers is invited to the advertisement of Robert J. Deakin & Co. on page 12. They make a specialty of horticultural implements, Brass Greenhouse Syringes, Pumps, &c. They say of the Excelsior Pump: "It is applicable to all horticultural purposes—for watering gardens, greenhouses, graperies, conservatories, orchard houses, washing windows, carriages, &c., and the value of this engine is enhanced by the circumstance that its utility is not restricted to the garden. From its power and portability it will be found of the most essential service in case of fire. It is fitted with discharge and suction hose for drawing water from a stream, tank or pail, is simple in construction, and easily worked. It throws a continuous stream, being a double-acting pump."

Bissell & Welles, Nos. 83 Chambers and 65 Reade streets, announce in their advertisement on the opposite page, that they will hold their first trade sale for the spring of 1879 on Wednesday, Feb. 19 and following days. At this sale they will offer all the second quality goods of the six cutlery companies, comprising the Table Cutlery Mfrs. Association.

The following circular explains itself:

Caution to the Trade.

Office of United States Stamping Company (successor to Joseph Scheider & Co.), 58 and 60 Beekman street, New York. Factories, Portland, Conn.

NEW YORK, January 29, 1879.

Gentlemen: We were yesterday shown a circular, purporting to issue from the firm of Joseph Scheider & Co., announcing the pretended removal of that firm from 58 Beekman street. It states:

"*We* beg to inform you that *we* have removed from 58 Beekman street," &c.

(Signed), "JOSEPH SCHEIDER & Co."

As this statement is false in fact and calculated to deceive the trade, we allege in contradiction:

1. That the late firm of Joseph Scheider & Co. was composed of Joseph Scheider and Lorin Ingersoll, and was dissolved at the election of Lorin Ingersoll, Dec. 30, 1878.

2. That if any such firm as Joseph Scheider & Co. is now in existence, it is a new firm, formed since that day, and in which Mr. Lorin Ingersoll has no interest whatever, and of which he has no knowledge, and which is in no way connected with the business for years carried on at this store under the name of Joseph Scheider & Co., and now continued by the United States Stamping Company, the successor of that firm, at 58 and 60 Beekman street, New York.

3. That the entire interest of Joseph Scheider in the late firm of Joseph Scheider & Co., including his share of its real estate, merchandise, patents and property of every kind and description, has been purchased from said Scheider by Mr. Lorin Ingersoll, and paid for by him, and transferred to said Lorin Ingersoll by valid instruments, in writing, under the hand and seal of said Scheider, executed January 8, 1879, in which purchase was particularly specified the Good Will of Joseph Scheider & Co. and the Self-Righting Cuspadore Patent; and all said property and good will has been transferred by said Ingersoll to the United States Stamping Company, and we are now the owners and possessors thereof.

As our previous circulars have stated, we have on hand and ready for immediate shipment a complete line of Japanned, Stamped and other Tin Wares, also all styles of the Patent Self-Righting Cuspadore. We trust that the trade will not encourage such a palpable breach of good faith among merchants as is displayed in this attempt to divert from us the good will which we have purchased and paid for, but that we may expect a continuance to our company of the patronage heretofore extended to the firm of Joseph Scheider & Co.

All orders promptly filled with standard quality of goods at lowest market rates. Please address United States Stamping Company, 58 and 60 Beekman street, New York.

Yours respectfully,
LORIN INGERSOLL, President.

We have received the following circular:

NEW YORK, Feb. 1, 1879.

Dear Sir: We take pleasure in announcing that we have this day united the interests of the late firm of Schoverling & Daly, and Spies, Kissam & Co., and will continue the business of Wholesale Gun and Pistol Dealers, under the name of Schoverling, Daly & Gales, occupying, for the present, both 84 and 86 Chambers street, and 279 Broadway.

All accounts of the late firms will be liquidated by us. We shall have increased facilities for doing business, and hope for a large share of your favors, relying upon the satisfaction heretofore given by the respective firms. Very truly yours,

AUGUST SCHOVERLING, CHARLES DALY, JOSEPH GALES, late Spies, Kissam & Co. } Late Schoverling & Daly.

IRON.

American Pig.—The general tone of the Iron market this week is more cheerful than we have noticed it in a long time. Although the only sales of magnitude which have come to our notice are about 7000 tons Nos. 1 and 2 X Thomas, at $17.50 and $16 respectively, there is so much improvement in the inquiry, and so much less disposition on the part of makers to make sales regardless of profit, than was the case some few months ago, that the trade feel encouraged in the belief that bottom prices have been reached, and a healthier condition of affairs is confidently looked forward to. The weather, and the fact that navigation is closed and is not likely to reopen speedily, have the natural effect of retarding business, but there is no doubt in the minds of well-informed people in such matters, that the consumption of Iron in this country is increasing year by year, and in this respect the prospect for the current year is satisfactory. We continue to quote: Foundry No. 1, $16.50 @ $18; Foundry No. 2, $15.50 @ $16.50; and Gray Forge, $14.50 @ $15.50.

Scotch Pig.—There is little doing in this branch of the Iron trade, and the only transaction we hear of, aside from the usual small retail lots required by local founders, is the sale of 100 tons Glengarnock, to arrive, on private terms. We still omit Glengarnock from our quotations, for the reason that there is none of this brand here. We quote Eglinton $19.50 @ $20, and Coltness $22.

Rails.—Since the large lots of Steel Rails for the Erie Railroad, reported last week, there has been no business of magnitude, although there is a good deal of inquiry. The mills are now nearly, if not all, supplied with orders for Steel Rails sufficient to keep them employed until October next, and, as a consequence, we note a firm tone to the market. We quote Steel at mill $41 @ $42. In Iron Rails no new business is reported, and we quote the same $32 @ $35 at mill, according to section, terms, &c.

Old Rails.—We hear of some inquiry for Old Rails, which it is expected will result in business, but no actual sales are reported. We quote 19.50 @ $20 here, which is the nominal price.

Scrap.—In the absence of business, we continue to quote No. 1 Wrought from yard $21 @ $22.

We have received the following circular:

PATERSON, N. J., January 25, 1879.

Gentlemen: In advising you of the complete restoration of our mills, lately destroyed by fire, we are glad to announce that our facilities are greatly improved for both increasing our production and reducing its cost. We propose to maintain the high standard of the "Passaic" Beams, Channels, Angles, Tees, Shafting, Merchant Bars, Rivets, Nuts, &c., &c., and continue to use only Puddled stock made from Selected Pig and no Scrap or Old Rails at all; thus enabling us to guarantee uniformity and standard strength. From our favorable location we can fill orders with exceeding promptness, as is well known, and besides, we carry at all times a full stock of sizes and shapes most in demand. Soliciting a continuance of the favorable relations we have so largely enjoyed,

We remain, respectfully,
THE PASSAIC ROLLING MILL Co.
New York Office, 138 Chambers St.

METALS.

Copper.—Manufacturers being supplied, the demand for Copper remains sluggish, and sales have been confined to 150,000 pounds Lake Superior at 15½¢. Baltimore is worth as much. There is nothing new from England per cable, but printed reports have come to hand, quoting on the 23d ult.: Best Selected, £63, and English Tough Cake, £62. We have also received the annual metal circular of Messrs. W. T. Sargant & Sons, London, of January 4, laying particular stress on the increased importation of Copper in the shape of pyrites from Spain. It will be remembered that the Spanish government, some four years since, while in financial distress during a time of revolution, sold to a Bremen syndicate of bankers its famous Copper mines at Huelva, the so-called Rio Tinto district. These bankers preferred a quick profit to a doubtful future, and while pocketing $700,000 on the translation in the short space of about a sixmonth, they transferred their rights to an English company, which has since been making the best of its acquisition, built a railroad from the Rio Tinto to Huelva, and spent a great deal of capital on this enterprise. The latter, to the present day, has not been very prosperous, but the London company adheres to it, apparently with large means at its command, and the result is a large Copper production from a quarter which would have laid dormant but for the energy now being displayed by these Englishmen. The amount of pure Copper estimated to have been extracted from pyrites in England at 2½ % @ 3 % has been 18,900 tons during 11 months of 1878, 24,800 in all 1877 and 17,700 in 1876. In 1869 but 11,100 tons were thus obtained. Spain, therefore, now produces in an indirect way about 13,000 tons of pure Copper annually. Aside therefrom Messrs. Sargant calculate that Chili, Australia and the United Kingdom have together produced last year 61,000 tons of pure Copper, against 59,500 tons in 1877. They at the same time mention that it is believed Chilean production, which was 48,000 tons in 1878, may, in 1879, drop to between 20,000 and 36,000 tons, which would go a great ways toward restoring the equalibrium between the world's wants and its output. But this possible Chilean decrease is problematical, and none of the papers from Valparaiso and Santiago we have received to date hint at any diminished output, present or prospective; on the contrary, they prove by statistics that Copper is being mined in Chili as extensively as ever. For Manufactured Copper we quote the lately adopted price-list arranged by the combination of manufacturers, viz.: New Sheathing Copper, 22¢; Braziers, 24¢, and Bolts, 24¢; American Yellow Sheathing Metal, 13½¢; Yellow Metal Bolts, 20¢, and English Yellow Sheathing Metal, 12⅝¢ @ 12¾¢, currency, in bond.

Tin.—Our market has stiffened since our last report. We quote, large lots, Straits, 14¾¢ @ 15¢; English Refined, none here; ditto Common, 14¼¢ @ 14⅜¢; and Banca nominally 19¢. About 1500 slabs Straits have been sold, while the arrivals sum up 4163. Singapore cables $19.25, and London £59. 10/ for Straits. Shipments from the Straits settlements to the United States in January have been 500 tons; to England the shipments have been 1025 tons, against 760 in 1878. The elaborate article in the annual review of Messrs. W. T. Sargant & Sons, London, on Tin, does not express a very favorable opinion as to the future of this metal. They say that the supply from Australia and Tasmania in 1878 has been simply prodigious, England alone receiving 10,327 tons. They make the entire Tin supply of the world from all quarters 35,493 tons in 1878, against 33,589 in 1877; in 1869 it was 21,353. They point to the visible supply on January, 1879, which was 18,761, against 16,108 in 1878, and add: "We think if the trade carefully study the visible supply, they will be unable to escape from the conviction that the moment any of the present holders make a serious attempt to relieve themselves of the stocks they hold, a collapse in value must ensue." The fact is that with the approach of the wool shipments from Australia there will be ample supplies of Tin from there, which makes excellent stowage. *Tin Plates.*—A great deal of activity is going on among dealers, but consumers are less anxious. The market is irregular and more or less nominal, with a tendency toward higher rates. We quote large lots, ordinary brands, per box, as follows: Charcoal Bright, $6.25 @ $6.50; in England, 22/ yesterday; ditto Ternes, $5.62½ @ $5.75, in England, 18/; Coke Tin, $5.37½ @ $5.50; in England, 17/6, and ditto Ternes, $5.25 @ $5.37½. Makers write that the decrease in production is in reality greater than had been estimated when the agreement was entered into, and add that the wages question should not be overlooked in connection with Tin Plates. Wages had gone down to the lowest ebb, and rebound with a more paying output.

Lead.—Business is light, lots sold being trifling in amount so far as Common Domestic is concerned, while 150 tons Refined sold at 4¼¢. We quote Common 4½¢ @ 4⅝¢. The general tone of the market remains a strong one, there being a good Western demand reported at full prices. They write from England under date Jan. 23: "Prices show a further decline, and now are for English Pig, best quality, £14.7/6; do. second quality, £14 @ £14. 5/; Spanish, £14; Sheet, £15. 5/, and Pipes, £16." Manufacturers' prices are quoted: Bar, 5½¢; Pipe, 5½¢; Sheet, 6½¢; Tin-lined Pipe, 12¢: No. 1 Solder, 10¢; all less 10 % to the trade.

Spelter and Zinc.—There is a combination in first hands to sustain prices, which does not prevent some small lots in second hands from being obtainable still at a slight shading. The general feeling is a decidedly strengthened one; Common at 4⅝¢ @ 4¾¢, and preferred brands of Western at 4⅞¢ @ 5¢. The aggregate amount of dealings has been a restricted one. There is nothing of special interest from Europe; in England the metal is dull and stationary; in some Continental countries it is looking up. We quote: Refined, 8¼¢ @ 8¾¢; Silesian, 5¾¢., and Bergenport from Lehigh Ore, 9¢. Sheet Zinc is unaltered at 6¼¢ for Domestic.

Nickel.—There is no change; the demand is moderate at $1.25 for Wharton's.

Antimony—Is in limited request at 11⅞¢ @ 12⅜¢, according to brands.

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending Feb. 4, 1878:

Hardware.

Boker Hermann & Co.
Hdw., cks., 8
Hdw., cs., 11
Hildick A. H.
Casks, 2
La Montague E.
Cutlery, cs., 10
Livingstone W. & F.
Grindingstones, 571
McCoy & Co.
Manganese, cks., 6
Packages, 7
Mount J. T.
Casks, 2
Parsons Geo.
Cases, 1
Peters Bros.
Mdse., pkgs., 2
Pappenheimer & Ludlow Hdw. Co.
Casks, 1
Cases, 1
Remington & Sons,
Arms, pkgs., 2
Schoverling & Daly,
Mdse., pkgs., 5
Wilcox E. B.
Wire, cases., 1
Wolffe H. & Co.
Cases, 1
Ward Asline,
Mdse., pkgs., 4
Cutlery, cs., 8
Wiebusch & Hilger Hdw. Co.
Cutlery and Hdw., pkgs., 74
Order,
Cases, 31
Casks, 5
Files, bxs., 1
Per. caps, bxs., 1
Packages, 44

Iron.

Brown Bros. & Co.
Bundles, 399
Rods, coils, 317
Milleken & Smith,
Wire, bdls., 416
Naylor & Co.
Bars, 1362
Phelps, Dodge & Co.
Sheet, bdls., 86
Order,
Plates, 5
Pig, tons, 400
Bars, 371
Sheet, bdls., 57

Steel.

Brown William,
Cases, 26
Bundles, 117
Dodge Alfred,
casks, 4
Prosser Thos. & Son,
Mdse., pkgs., 44
Woodford W. O.
Bundles, 91
Cases, 1
Order,
Scrap, tons, 5
Rods, bdls., 64
Bundles, 110
Casks, 26
Cases, 7
Packages, 43

Metals.

Bruce & Cook,
Tin and terne plates, bxs., 100
Brown J. B.
Scrap metal, pkgs., 9
Baring Bros. & Co.
Tin slabs, 3054
Byrne Joseph & Co.
Tin plates, bxs., 280
Cort N. L. & Co.
Tin plates, bxs., 1822
Cortis, R. J.
Tin, bxs., 435
Galway & Casado,
Lead, pigs, 400
Hentze H. & Co.
Tin, slabs, 696
Lamarch H.
Rolled zinc, cks., 76
Leaycraft & Co.
Lead, bbls., 3
Copper, bbls., 1
Copper boilers, 6
O'Kenan A. & Marneffe,
Tin plates, cs., 15
Naylor & Co.
Tin plates, bxs., 2751
Nevada Bank,
Tin plates, bxs., 3449
Pratt Chas. & Co.
Tin plates, bxs., 1476
Phelps, Dodge & Co.
Tin plates, bxs., 11,533
Banca tin, slabs, 300
Black taggers, bxs., 118
Wheeler E. S. & Co.
Tin plates, bxs., 500
Order,
Tin, ingots, 1400
Tin plates, bxs., 10,931
Tin slabs, 1760
Tin and terne plates, bxs., 2312
Tin plates, cs., 35

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending Feb. 4, 1879:

	Quan.	Value.
Danish West Indies.		
Mf. iron, pgs..	10	$79
Hdw., pgs....	4	95
Hamburg.		
Hdw., pgs....	136	1,180
Copper, tons..	85	27,350
Mach'y, pkgs.	33	4,994
Mf. iron, pkgs.	7	227
Ag. imp., pkgs	22	922
Pistols, cs....	1	600
Pit'd ware, cs.	3	193
Bremen.		
Mf. iron, pkgs	11	600
S'dpaper, bdls	15	127
Pit'dware, cs..	1	110
Pumps, pgs...	7	250
Mach'y, cs....	2	390
Ag. imp., pkgs	17	1,525
Rotterdam.		
Hdw., cs.....	48	741
Slates, cs.....	51	257
Mf. iron, pkgs	19	354
Mach'y, pkgs.	27	1,405
Ag. imp., pkgs	25	900
Dutch West Indies.		
Pl'd ware, cs..	3	341
Nails, cs.....	17	221
Cutlery, cs....	3	44
Mf. iron, pkgs	12	111
Hdw., cs.....	16	179
Revolvers, cs..	2	168
Tinware, cs...	4	63
Antwerp.		
Pumps, pkgs.	1	60
Hdw., cs.....	14	329
Rifles, cs.....	1	300
Copper, bars..	813	17,675
Zinc ore, tons	85	680
Ag. imp., pgs.	16	1,100
Hull.		
Mach'y, case.	1	90
Hdw., cs.....	51	5,263
Mf. iron, pkgs	4	60
Liverpool.		
Hdw., cs.....	65	5,139
Mach'y, cs....	92	2,851
Ag. imp., pkgs	27	3,955
Cutlery, cs....	1	200
Arms, cs.....	1	93
Car wheels...	100	501
Revolvers, cs.	1	445
Brass g'ds, cs.	2	700
London.		
Hdw., cs.....	85	2,402
Mf. iron, pkgs.	7	628
Brass go'ds, cs	7	330
Zinc, cks.....	2	90
Mach'y., pkgs.	16	4,500
Tin, bxs.....	6	170
Ag. imp, pkgs.	18	140
Glasgow.		
Ag. imp., pkgs	40	1,596
Hdw., cs.....	22	538
Lea belting,cs	1	245
Mach'y, cs....	2	70
British Guiana.		
Hdw., pgs.....	6	78
British Honduras.		
Hdw., pkgs...	9	63
Mach'y, cs....	2	110
Nails, kegs....	40	98
Tinware, cs....	17	207
Cartridges, cs.	2	120
Mf. iron, pkgs.	8	346
Cutlery, cs....	15	282
Arms, cs.....	4	263
British West Indies.		
Nails, kegs....	124	528
Tinware, cs...	4	142
Mach'y, pkgs..	1	75
Mf. iron, pkgs	85	746
Hdw., pkgs....	84	1,272
Car. matl, pgs	12	416
Ag. imp., pkgs	9	56
British North American Colonies.		
Powder, kegs.	575	1,081
Mf. iron, pkgs	50	236
Hdw., cs.....	10	429
Coal, tons....	611	1,571
Havre.		
Ag. imp., pkgs	418	33,875

	Quan.	Value.
French West Indies.		
Mf. iron, pkgs	7	$42
Mach'y, pgs..	1	75
Cge. mtl., pgs.	20	195
Cadiz.		
Coal, tons.....	60	250
Pumps, pgs...	9	400
Mf. iron, pkgs	4	93
Japan.		
Hdw., pgs.....	33	250
Nails, kegs...	170	416
Cuba.		
Mf. iron, pkgs.	197	1,443
Mach'y, pgs..	88	5,699
Tinware, cs...	10	232
Cutlery, bxs..	3	168
Nails, kegs...	31	79
Cop. tubes, cs.	8	900
R.R.mtls. pgs.	1264	4,792
Grindstones...	70	196
Scales.....	1	248
Coal, tons....	2257	6,779
Hdw., cs.....	86	1,719
Ag. imp., pkgs	15	345
Brass, bbls....	135	13,000
Porto Rico.		
Hdw., cs.....	5	142
Brit. ware, cs.	2	66
Mach'y, cs....	1	860
Mf. iron, pkgs.	15	320
Hayti.		
Hardware, cs.	8	101
Nails, kegs....	30	72
United States of Colombia.		
Mf. iron, pkgs	107	1,265
Cutlery, cs....	73	2,610
Cartridges, cs	1	36
Gun carriage..	2	610
Arms, cs.....	6	728
Grinds'e fix. cs	7	86
Powder,lbs....	400	93
Hardware,cs..	163	3,493
Pl'd ware, cs...	5	601
Mach'y, cs....	63	2,692
Pumps, pkgs..	6	87
Nails, kegs....	19	45
Tinware, cs...	4	34
Revolvers, cs.	5	574
Ag. imp., pgs.	39	977
Metal go'ds, cs	1	84
Rifles, bxs....	2	1,817
Brass go'ds, cs	1	120
Argentine Republic.		
Ag. imp., pkgs	482	10,947
S'ndp'p'r., cs..	15	263
Irons, cs.....	30	188
Nails, kegs....	50	150
Mf. iron, pgs..	40	295
Hardware, cs.	404	7,658
Slates, cs.....	5	18
Shot, kegs....	80	450
Tacks, cs.....	32	200
Cisplatine Republic.		
Coal, tons.....	250	1,250
China.		
Rifles, cs	1	50
Hardware, cs.	12	72
Cartridges, cs.	81	2,430
Genoa.		
Cge. matl., pgs	3	30
Coal, tons.....	150	375
Mexico.		
Arms, cs.....	1	137
H'dware, pgs.	54	451
Pumps, pgs..	2	227
Coal, tons.....	40	134
Cartridges, cs.	8	113
Mach'y, pkgs.	33	1,269
Mf. iron, pkgs	930	5,214
Bellows.....	12	43
Brazil.		
Mf. iron, pkgs.	62	646
Mach'y, pkgs..	50	1,084
Ag. imp., pkgs	89	1,529
Pumps, pkgs..	12	450
H'dware, pgs.	9	200
Sandwich Islands.		
Mf. iron, pkgs	3635	43,220
Mf. brass, pgs.	19	1,860
H'dware pkgs	789	12,740
Mach'y, pkgs..	26	8,170
Mf. cop'r, pgs.	4	1,000
Ag. imp., pkgs	125	1,365
Tinware, cs...	7	175
Grindstones...	10	10

COAL.

The market for Coal during the past few days has been very weak, with prices nominally those of the auction sale. The retail dealers speak of the retail trade in the city as being very slow indeed, especially since the end of the cold weather. Although the market was exceedingly brisk for a time, the amount of Coal laid in does not appear to have been very large. Yards here are bare, but dealers are buying from hand to mouth, the constantly-falling prices rather discouraging purchasers and making them timid. Eastern markets are reported bare of Coal. Boston for the moment has a fair supply, but with even our present weather this will not last for very long. Some sizes of Coal are very scarce, and for these there is a good demand. Other sizes do not seem to be wanted, even at the auction prices, which we hear have in some instances been shaded. It is quite evident to those familiar with the trade, that many of the companies are at the present time putting Coal upon the market at or below cost.

OLD METALS, PAPER STOCK, &c.

The Old Metal market has somewhat improved since last week. Lead, Copper, Brass and Composition are in good demand, and prices are firm at quoted rates. Business in the Rag and Paper Stock market still continues unchanged from the dullness previously noted, and prices are growing weaker.

The purchasing prices offered by dealers for Old Metals are as follows;

Copper, heavy	per lb.	$0.1	@ ....
Copper Bottoms	"	.10½	@ ....
Yellow Metal	₩ lb	.08½	@ ....
Brass, heavy	"	.09½	@ ....
Brass, light		.08	@ ....
Composition, heavy	"	.11½	@ ....
Lead, solid	"	.03¾	@ ....
Tea Lead	"	.03¼	@ ....
Zinc	"	.03¼	@ ....
Pewter, No. 1	"	.10	@ ....
Pewter, No. 2	"	.08	@ ....
Wrought Iron	pr ton.	$16.00	@ ....
Light do	"	9.00	@ ....
Stove Plate	"	9.00	@ ....
Machinery do	"	11.00	@ ....
Grate Bars	"	3.90	@ ....

The prices current for Rags, &c., are as follows:

Canvas, Linen	per lb.	3 c.	@ 3½c.
White Cotton, New	"	4½c.	@ ....
" " No. 2	"	1½c.	@ ....
White, No. 1	"	3¼c.	@ 3¾c.
" No. 2	"	2 c.	@ ....
Seconds	"	1½c.	@ ....
Mixed, Woolen	"	2 c.	@ 3 c.
Soft, do	"	6½c.	@ 7 c.
Gunny bagging	"	3 c.	@ ....
Jute butts	"	2¾c.	@ ....
Kentucky bagging	"	3 c.	@ ....
Book Stock	"	2½c.	@ ....
Newspapers	"	1¼c.	@ 1½c.
Waste Paper and Scraps	"	¾c.	@ ....
Kentucky Bale Rope	"	4 c.	@ ....
Tarred Shaking	"	1 c.	@ 1¼c.
Grass Rope	"	....	@ 2½c.

PHILADELPHIA.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Feb. 4, 1879.

Pig Iron.—The market since date of our last report has been rather quiet, but the feeling of firmness is increasing, and orders for forward delivery are not sought for unless at somewhat higher prices. Buyers are making careful inquiries, and the market is closely scrutinized by all parties interested. There are sellers as well as buyers who appear to talk the market down, advancing as a reason the comparatively small amount of business actually transpiring, as well as the large capacity for production ready to be used at short notice. These are facts that cannot be altogether ignored; but, on the other hand, it must not be forgotten that sales to a very important amount for forward delivery have already been made, and also that there are others anxious to place their orders in a similar way. To put the matter fairly, it may be said that there are more buyers than sellers, and although no general advance has been made, it is quite likely that higher prices will have to be paid, unless parties are willing to take the risk of deferring their purchases until a later date. The prospects of the future are not of such a character, however, as to encourage postponements; consequently, there is an uneasy feeling on all sides; sellers desire an advance and also wish to retain their customers, and to do both seems impossible. Consumers find no difficulty in placing their orders at current rates for all that they require for immediate delivery; but there is an evident anxiety in regard to the future, which is increased by the fact that sellers are unwilling to accept business extending beyond the next two or three months. The outlook seems to warrant the expectation of a larger consumption than during the past two or three years. Stocks are gradually diminishing, while producers are beginning to realize the fact that prices have been ruinously low. The stiffening in value of other metals, as also in some descriptions of finished Iron, is also having its effect on Pig metal; and all classes seem to have reached the conclusion that, even if there is not much of an advance, there certainly can be no further decline. Under these circumstances the market may be considered as in a healthy condition. There are no evidences of supplies being in excess of requirements, but on the contrary, as intimated in our recent reports, several of the leading companies have already sold a large portion of their year's product, and are no longer naming prices unless to their regular customers, and then only for such moderate amounts as may be required for early delivery. The demand for Bessemer Iron is active, and several furnaces have been recently put on this class of Iron. The tendency of the market has been such that we make our quotations somewhat wider, with the majority of transactions at medium figures, say, No. 1 Foundry, $17 @ $18; No. 2, $16 @ $16.50; Gray Forge, $15 @ $16. Sales in one or two instances have been at exceptionally low prices, but the general market is firm, with an upward tendency.

Ores.—The Chester Iron Company have issued a new price list, as follows: S. W. Hill, Birch Tree Tunnel and East Cut ores, $2.50, f. o. b. Hacklebarney (average phosphorus thirty recent analyses, .044, .037, .041, .0357); Upper Tunnel, George and North veins, $2.35, f. o. b.

Muck Bar.—There is nothing new to report; there are buyers in the market for large quantities at about $30, but the offerings are light and $32 @ $33 is usually asked. Latest sales in quantity, as mentioned last week, were at about $30.

Blooms.—The market is steady and fairly active at former prices, viz.: Blooms (2464 lb), $38 @ $39; Northern Ore Blooms (2240 lb), $33 @ $37; best quality Charcoal Billets (2240 lb), for wire and steel purposes, $58 @ $60; Bars do., $62.50 @ $65; Sheet Iron Blooms, cornered (2464 lb), $53 @ $55; Cold-blast Charcoal Plate Blooms, $50 @ $53; run-out Anthracite, $45 @ $47.50.

Structural Iron.—There is nothing of special importance transpiring, and no sales out of the general routine of business are reported. There is a fair distribution of work at all the leading mills, and prices, though not quotably higher, are firm, and concessions less frequent than during the past six months. The prospect of more work on the elevated railways has a tendency to stiffen the market, besides which, the probability of higher cost in the raw material is a matter of serious consideration. The general condition of business in shapes is quite satisfactory. With full employment, present and prospectively, and with prices tending in sellers' favor, there is no room for complaints. We continue our late quotations as follows: Angles, 2.1¢ @ 2.3¢; Tees, 2.3¢ @ 2.4¢; Beams and Channels, 2.5¢ @ 2.7¢, according to specification.

Plate and Tank Iron.—Although the market cannot be called active, there is a fair amount of business offering; but as the mills have very little work on hand, competition for new orders has been unusually close. Prices have been worked down to the lowest point, but there is a slight reaction this week, and we are informed by several who are making bids on work to be given out in course of a few days, that they have advanced their figures $1 to $2 per ton as compared with last week. At what price the orders may be taken, however, remains to be seen, but it is certain that there are some who intend getting higher prices or let others take the business. There is a better outlook for Plates, Bridge, Ship and Tank, and car building is picking up again; and while there are no very large orders in the market, there is a prospect of a respectable average trade. In Skelp Iron there has been a good deal of business done since the first of the year, but at very low prices, some 600 tons having been closed last week at about 1.8¢, Philadelphia delivery. Prices are nominally higher, say 1.85¢ @ 1.9¢ for Skelp. Common Plates, 2.1¢ @ 2.3¢; Tank Iron, 2.3¢ @ 2.5¢; C. No. 1, 2.4¢ @ 2.6¢; Shell Iron, 2.75¢ @ 2.9¢; Flange Iron, 3.7¢ @ 4¢; Solid Fire-box, 4.85¢ @ 5¢, and Best Bloom, 5.5¢ @ 6¢.

Sheet Iron.—The market for thin sheets is active and firm, with a pressing demand from the trade for large lots at prices ruling at the close of the year. Manufacturers have been willing to meet the demand for small lots, but this appears insufficient, and it seems as though the result would be higher prices immediately. Orders for lots of 1000 to 1500 bundles each have been declined in several cases under our own observation, and an advance of from $2 to $5 per ton is asked. It is yet uncertain what the response will be; but there is no doubt of the fact that this is no longer a buyer's market exclusively, and, unless on terms satisfactory to themselves, sellers seem determined to decline all large orders. We continue our last week's quotations, as there has been no definite change as yet, but the tendency is towards higher figures. Common Sheet, No. 20 to 23, 2.9¢ @ 3¢; No. 24 to 26, 3¢ @ 3.1¢; No. 27 to 28, 3.2¢ @ 3.3¢; Best Refined Sheet, No. 25 to 28, 3.3¢ @ 3.4¢; No. 22 to 24, 3.2¢ @ 3.3¢; No. 16 to 21, 3.1¢ @ 3.2¢; Best Bloom Sheets, No. 25 to 28, 5.2¢ @ 5.3¢; No. 22 to 24, 5.1¢; No. 16 to 21, 4.8¢ @ 4.9¢; Refined Plates or Blue Annealed, 5-16 to 16, 2.4¢ @ 2.5¢; American, R. G., 5-16 to 16, 3¢ @ 3.1¢; Best Bloom, 5-16 to 16, 4.9¢ @ 5¢; A Patent Planished, 10½¢; B Patent Planished, 9½¢; Best Bloom Galvanized, 45 % discount; second quality, 55 %; extra discounts for large lots.

Bar Iron.—The feeling of firmness in other departments is to some extent reflected in the Bar trade, but we cannot call the market very active, although there is a fair business doing at the old figures. Consessions in price are scarcely asked for, but in extras there is the same difficulty as previously noticed. A 500-ton lot of Bars was placed during the week at 1.87½¢., but it would be difficult for the buyer to duplicate the transaction unless by taking a fair proportion of extras. Many of the mills are quite full of orders, and unless at some little improvement in prices, they are indifferent about new engagements. There are the usual complaints about business being dull and unsatisfactory, but the anxiety seems to be more in regard to securing an advance in prices than anything else. Buyers are prepared to increase their orders at bottom figures, but as this is not acceptable to manufacturers, the actual amount of new business is not important. The developments of the next two or three weeks will probably give some definite color to the market, which in the meantime may be considered steady, with a slight tendency toward higher prices. We quote: 1.5¢ @ 1.6¢ for Common; 1.7¢ @ 1.8¢ for Good Medium; and 1.9¢ for Best Refined.

Steel Rails.—The market is firm, with a tendency toward higher prices. No sales of importance have been reported for several days past, but the usual demand for small lots has been met at about $42 @ $44 at mill, according to location and terms of payment. The mills are said to be too much crowded already, so that orders for large lots are not sought for. It is not likely that the above quotations would be shaded to any extent, and higher prices seem to be looked for as the season advances.

Iron Rails.—We are not advised of any sales during the past week, but there are inquiries from new quarters, and prospects of a healthy spring trade. Prices are firm, and concessions could not be had from the regular quotations unless for specially desirable orders. The mills are well employed, and sellers show more anxiety in regard to prices than the amount of business. Sales have been made at $35 @ $37 on the seaboard, but $32.50 @ $35 at mills, on a cash basis, may still be regarded as a fair average quotation.

Spikes.—A fair demand and prices steady, as follows: 5½ x 9-16, 2¢; ¼ x 4 and longer, 2.3¢; 7-16 x 4 and longer, 2.4¢; ⅜ x 3½ and longer, 2.7¢; ⅜ x 3 and longer, 2.8¢.

Old Rails.—The market is in much the same condition as last reported. Quotations vary according to the interests represented. Sellers claim $20.50 @ $21 as being inside quotations, while buyers views are about $1 per ton less. Purchases have been made by Philadelphia parties at $19 @ $19.50 on cars at Perth Amboy, and $20.50 at Harrisburg—all in 500 or 1000 ton lots. We cannot learn of any sales during the week for Philadelphia delivery, and so far as we know no spot Old Rails have been offered. Prices are therefore entirely nominal at $20.50 @ $21. There is a fair inquiry from points in the interior, but $23, Pittsburgh, is now said to be the extreme limit, a decline during the week of about 50¢ per ton.

Old Car Wheels—Are in demand, but we cannot learn of any being offered. Last sale was at $16, but it is quite likely that higher prices would now be paid for good quality. Old Axles are also wanted at about $24.

Scrap Iron—Is in active demand, and full prices can be obtained for desirable qualities. We quote: Cast, $13.50 @ $15; Wrought, $20 @ $22.50.

Nails.—The market is a little unsettled, owing to local competition, but it is probably only of a temporary character. In the meantime the best brands of Philadelphia Nails are being offered at something under $2.10 for 10d.

PITTSBURGH.

Office of *The Iron Age*, 77 Fourth Avenue, PITTSBURGH, PA., Feb. 4, 1879.

The first month of the year has come and gone, and, while in point of business the expectations of the most sanguine have not been realized, there is reason to feel encouraged. The country at no time since the panic has been in as good condition as it is at present; with specie payments resumed, continued large exports, no political agitation and confidence gradually being restored, there is, we think, reason to be hopeful of the future. How it is elsewhere we do not know, but here in Pittsburgh our manufacturers take a hopeful view of the situation, and some of them already, although working up to their fullest capacity, have orders sufficient to absorb their entire production. One large concern booked enough orders last month, so it is stated, to absorb its product three-fourths of the year, and quite a number of our Iron mills are now working double turn. As stated in our last report, there is no apprehension felt so far as the volume of business is concerned; our manufacturers generally did more in 1878 than during any preceding year since the panic, and there is every indication that they will do still more in 1879. The chief cause of complaint is that there is so little, if any, margin for profit; while the consumption of nearly all the leading articles of manufacture is increasing, the demand is still insufficient to give employment to the entire capacity of the country, and, while this continues to be the case, there will be more or less competition, and "cutting" will be more or less indulged in. Efforts have been made time and again within the past few years with a view to curtailing production, but, in most instances, they afforded only temporary relief, as there were so many conflicting interests that it was found impossible to hold these combinations together any length of time. The fact that the consumption is increasing inspires confidence, and leads to the belief that our manfacturers will soon be able to secure more remunerative prices for their products.

Pig Iron.—There has been more activity developed in the market the past week, the volume of business reported being much larger than during any preceding week this year; and, while prices remain unchanged, a firmer and more hopeful feeling is being developed. As stated in a former report, the trade generally—buyers as well as sellers—are well satisfied that prices will go no lower; and the latter are hopeful of being able before long of securing better rates, especially for standard brands of both Mill and Foundry. Coke has already gone up 30¢ @ 35¢ per ton, and it is about as certain as anything can be that ores will be higher; and with the cost of production increased, producers must either have a better price for their products or blow out. This is the situation with our Western furnacemen at the present time; they have little or no margin at current rates under the most favorable auspices, and with the cost of production increased, they must either have more money for their product or stop making it. That some consumers are apprehensive of an advance is well known, although, as a rule, they continue to buy only as immediate wants necessitate. We hear of one mill having contracted for a six months' supply, and it is doubtful whether any considerable contracts would be made for desirable and well-established brands of Mill, particularly for future delivery, at ruling rates, as the supply of the kind in question is small and the production is also light. Common grades, however—the product of common ores with a large percentage of cinder—are in good supply, and can be obtained without any difficulty at easy rates. Bituminous Coal Irons quoted at $18 @ $20, 4 mos., for Foundry; Mill, Neutral, $16.50 @ $17, 4 mos.; do. White and Mottled, Red-short, $17 @ $17.50; do. all Ore, Red-short, $19.25 @ $19.50; Bessemer, $20. Coke Iron, $16, cash, @ $16.50, 4 mos., for Mill, with sales of 2,500 tons reported at quoted rates. Anthracite—Foundry, $18 @ $20, 4 mos.; Mill, $16.50 @ $17, 4 mos., for Neutral, to $18.50 @ $19 for strictly Red-short. Charcoal.—Sales No. 1 H. R. Foundry at $23.50 @ $24; Eastern Cold Blast at $26 @ $30, 4 mos.; Hanging Rock do., $33 @ $35.

Manufactured Iron.—The reports of the market are conflicting; some manufacturers are well supplied with orders, as is evidenced by the fact that they are running double turn. While others are not so fortunate, however, all complain in regard to prices, and with good reason, too, as they are entirely too low, and for ordinary sizes and styles, under the most favorable circumstances, yield little or no margin for profit. While hereabouts there is a very fair business in the aggregate, better possibly, than usual for some years past at this particular time, the fact remains apparent, however, that the demand is not sufficient to furnish employment for all the capacity, and while this continues it is almost impossible to get prices up to where they should be. The low price of Steel has curtailed the consumption of Iron very materially, as for many purposes, owing to its cheapness, it has almost entirely supplanted Iron, although it is equally true that Iron, for some reason, is taking the place of wood. Bars may be fairly quoted at 1.75¢, 60 days; Sheet, 2.75¢ @ 2.80¢ for No. 24; Tank, 2.40¢ @ 2.50¢, same terms, with usual discount of 2 % for cash.

Nails.—There has been no change in the situation since the date of our last report; business continues quiet, as it usually is at this particular time, but an increased inquiry is looked for within the next week or two. To makers prices continue very unsatisfactory, and it is doubtful whether any considerable quantity could be bought here, either for present or future delivery, at current rates. There is every indication of a big spring trade. Large orders are expected from the Western States and Territories, to which emigration has been very heavy the past year, and there the consumption will no doubt be larger the present year than elsewhere. The production here continues very light, and has been since last fall. Some factories stopped altogether, none working up to anything like their full capacity, making just enough to fill local orders, and as a consequence stocks are very small. We continue to quote at $2.05, 60 days, with 2 % off for cash.

Horse and Mule Shoes.—Juniata brand still quoted, in 100-keg lots, "Government" pattern, at $3.50 for Horse and $4.50 for Mule, and Roadster pattern, $3.75, all cash. There is usually a very fair trade this month.

Wrought-Iron Pipe.—The demand for all kinds of Pipe continues light, as it usually is at this particular time, and there is not likely to be any material improvement for some weeks to come. Both lists are still quoted, and if anything there is more being sold on the old than the new. As the market is open, there is no uniformity in discounts, each firm being free to make its own rates, and the consequence is, business is in anything but a satisfactory condition. We continue to quote 35 @ 40 off new list for Gas, Water and Steam, and 65 @ 70 off old list; Boiler Tubes, 45 off; Oil-well Casing and Tubing, net cash.

Steel.—While some of our manufacturers report that they are well supplied with orders, others make a very different statement; and, while so far as the volume of business is concerned there is possibly no particular reason for complaint, prices are unsatisfactory, competition being sharp, the result of a largely increased production within the past few years. Shoenberger & Co. of this city, are making preparations at a cost, it is reported, of over $100,000, to manufacture Steel, from which it is evident that they, when they get into operation, will add considerably to the already large production. True, the consumption is increasing steadily and rapidly, owing largely to its cheapness; but the capacity is being increased rapidly, and of late years has kept ahead of the increased consumption. Manufacturers are apprehensive, in view of what has been stated, that the Steel business, like that of Iron, will be overdone before long, but with better times we think there will be a demand to absorb the entire product, and that, too, at prices that will afford a living margin for profit. We continue to quote Tool Steel at 10½¢ @ 12½¢, as to quality; Machinery do., 5¢ @ 7¢; Spring do., 4½¢ @ 6½¢; Boiler Plates, 6½¢ @ 7½¢.

Rails.—There is no abatement in the demand for Steel Rails, and prices are quoted firm at $43.50 @ $44, cash, delivered free on board cars in Pittsburgh. The Edgar Thomson Co. are reported as having booked orders last month for some 50,000 tons, enough to absorb their entire product for the next nine months, as their total capacity is placed at 65,000 tons per year. Steel Rail Ends and Blooms still quoted at $28 @ $32, according to lengths; Steel Blooms, $42 @ $45; do. Billets, $44 @ $47, all cash, at mill; Old Iron Rails continue in light supply, and are quoted firm at $23.50 @ $23.75, cash.

Scrap.—There has been but little change in the situation for some weeks, with the exception, possibly, of a firmer feeling and an unwillingness on the part of dealers to sell to any extent at bottom figures. We quote: No. 1 Wrought Scrap at $22, net; Boiler Scrap, $22; Car Springs, $30 @ $31; Car Axles, $27 @ $28; Sheet Scrap, $8 @ $9; Wrought Turnings, $15; Car Wheels, gross, $19 @ $20, said to have been some considerable sales recently at $19; Grate Bars, $10 @ $10.50; Cast Borings, $11 @ $11.50.

Window Glass.—The demand continues light, as it always is at this particular time, and it is not likely that orders will commence to come forward with any freedom until next month. Manufacturers are now engaged in working up stock for the spring trade, and we are in hopes that business this spring and summer may turn out even better than they anticipate. The business of 1878 was much larger than that of 1877, here in Pittsburgh, and it is expected that 1879 will exceed that of 1878; however, it is better prices, rather than increased business, our manufacturers are most anxious for. Discounts are still quoted at 75 and 5 to 75 and 10 for car-load lots. If business turns out as expected an effort will probably be made to have a reduction made in discounts.

Coke.—The general position of the market remains much the same as noted in our last report; while there is no apparent abatement in the demand, prices remain as last quoted, ranging from $1.15 to $1.25 per ton, delivered free on cars at works. Dealers generally report that they have orders for all they can make or obtain, and the market is reported firm at quotations.

Coal.—There is a continued fair demand, and liberal shipments are still being made by rail; may be quoted at 4¼¢ @ 4¾¢ per bushel, delivered free on cars in Pittsburgh. Since our last some 2,000,000 bushels were shipped by river, mainly to Cincinnati and Louisville.

CHATTANOOGA.

Office of *The Iron Age*, Market and 8th Sts., CHATTANOOGA, Feb. 1, 1879.

The market is without such change as would justify an advance of figures on Crude or Manufactured Iron, but there are not wanting signs that a substantial advance is certain to take place soon and be maintained. Holders are firmer, stocks are lower, orders are plentier, than at any corresponding period for three years past. Furnacemen are particularly cheerful. There will certainly be one, probably two new furnaces built in this district the coming summer. The mills are all full of work, and running double turn. The scarcity of high-grade metals continues, the furnaces making Car Wheel and other fine Irons having sold ahead largely and carrying no stocks at all to supply transient trade. The weather has been May-like during the week, ending with a biting north wind to-day.

Pig Iron.—Stocks are light in all the high grades, and those carrying considerable amounts of Mill and Forge are not anxious to sell. The movement for the week has been fair, rather larger than usual at this season. Coke Irons—No. 1 Foundry, $17.50 @ $18; No. 2, $15.50 @ $16; Gray Forge, $13.50 @ $14; White and Mottled, $11.50 @ $12. Hot-Blast Charcoal—No. 1 Foundry, extra, $20 @ $21; ditto, $18 @ $20; No. 2 Foundry, $16 @ $18; Gray Forge, $15 @ $17; White and Mottled, $15. Cold Blast Charcoal—Car Wheel Metal, $22.50 @ $27.50; do., Extra Standard, $24 @ $29.50; Forge, $17 @ $22.

Muck Bar—$27 @ $34. Old Rails, $18 @ $18.50. Old Car-wheels, $18.

Ores.—Brown Hematite, 50 to 56 %; per ton, $1.75 @ $2.25. Red Fossiliferous, 50 to 56 %; per ton, $1.70 @ $1.90. The above

prices for ores delivered in Chattanooga on cars, or on the wharf from flat boats. The market has been lightly supplied for two weeks past, on account of the difficulty of getting boats up the river. The water having receded to a good boating stage, a plentiful quantity is now arriving.

Nails.—The market continues good, the mills having orders ahead sufficient to keep them running full for some weeks. We quote at $2.25 rates, usual discount on job lots.

Manufactured Iron.—Those who expected a sudden rise in Merchant Bar and other mill products have been disappointed. Those expecting a better trade, firmer rates, and better prospects for the future are altogether satisfied with the situation as compared with last year. Our mills are all on full time, and are selecting the best from their orders. We quote Bar at $2; Railroad Spikes, $2.50; Light Rail, $2.25; Track Bolts, $3; Trestle Bolts, $4.

Coke.—Washed Foundry, 11¢ to 15¢ per bushel, free on cars in Chattanooga. Furnace Coke in full supply at $2 @ $2.50 per ton. We hear of offers of a good article of Furnace Coke at $2 per ton, free on cars at Chattanooga, or $1.50 per ton at the works.

Coal.—Trade is fair, with a downward tendency. Best Household Coals are not quotable above 12¢, delivered. Run of mine to manufacturers, $1.50 @ $1.75 per ton. The tendency of Coal of all grades is downward. We shall probably quote at $1.30 @ $1.40, run of mine, free on cars in Chattanooga, before the coming summer closes.

Pig Lead.—From local mines, 4¢.

Ingot Copper.—The slight advance realized is maintained. We quote at 18¢.

Iron Rails.—The mill here quotes them dull at $34.50 @ $35. There is little doing except in the way of re-rolling small lots.

BOSTON.

FEB. 1.—*Pig* continues very quiet, and sales are effected with difficulty. Sales of No. 1 have been made from wharf at $18. At the shipping ports Foundry No. 1 is still nominally quoted at $16.50 @ $17; Foundry No. 2, $15.50 @ $16.50; Gray Forge, $14.50 @ $15.50. There is nothing new in the market for Scotch Pig. Eglinton is still held at $22.50, Glengarnock at $24, Gartsherrie at $25 and Coltness at $25.50 @ $26. A depressed market is again cabled this week. Nails have been in fair demand, jobbing now at $2.25 @ $2.30. For 100-keg lots $2.20 is the price. Sheet is selling at 3¢ @ 3¼¢ ₱ lb. Russia is quiet at 10¼¢ @ 10¾¢. We quote English Spring Steel at 7¢ @ 8¢, gold; 8¢ @ 11¢ for German; 9¢ @ 11¢ for Machinery; 14¢ @ 15¢ for Cast; 10¢ @ 12¢ for Blister; 8¢ for American Spring; 13¢ @ 13¾¢ for Cast; 9¢ for Blister, and 7⅝¢ @ 8¢ for Machinery. In Plate Iron there continues to be a fair degree of activity in Tank, which is selling steadily at 2¼¢. Boiler Plate is very dull, quoting 2½¢ for No. 1 Charcoal; 2½¢ @ 2¾¢ for No. 1 Shell, and 3⅝¢ for Flange. Merchant Bar jobs at $1.65 @ $1.75. *Copper* is quiet but steady, and we quote at 15½¢ @ 15¾¢. For manufactures we quote: New Sheathing at 24¢ @ 26¢. The outside price rules in small transactions, but large buyers are purchasing at the inside figure. Bolts are quoted at 26¢ @ 28¢. Yellow Metal Sheathing continues easy, quoting 12½¢ @ 13¢ for English, and 13¢ @ 13½¢ for American; Yellow Metal Bolts, 18¢ @ 20¢. *Lead* is firm at a further advance, and a number of holders continue out of the market. We quote: Pig, 4¾¢ @ 5¢, currency; Sheet, 6½¢; Pipe, 6¢; Tin-Lined Pipe, 12¢; Bar Lead, 6¢; all of these excepting Pig are subject to the usual trade or 10 % discount. *Antimony* is in light demand, but is steady, and we quote 12¢ @ 12½¢. *Spelter* is dull, being held at 4½¢ @ 4¾¢ for the various grades. *Tin* is quiet but firm, with a steady feeling among holders. We quote: Straits, 14¾¢ @ 15¢; Banca, 19¢; Refined English, 14¾¢ @ 15¢, gold. We quote Plate: Charcoal, I. C., $6.50; Coke, $5.50 $5.75; and Charcoal Terne, $6 @ $7.50. —*Commercial Bulletin.*

BALTIMORE.

Mr. W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports us the following, under date of Feb. 3: This market remains much as last reported; there is quite a perceptible hardening in values, accompanied with improved inquiry for early wants.

Refined Bar Iron, 1 to 6 wide by ⅜ to 1 thick	₱ lb	1.85 @ 2 ¢
Refined Bar Iron, 1 to 4½ wide by 1½ to 2 thick	"	1.85 @ 2 ¢
Refined Bar Iron, ¾ to 2, Round and Square	"	1.85 @ 2 ¢
Hoop iron, 1½ wide and upward	"	2½ @ 2¾¢
Band Iron, from 1¼ to 4 in. wide	"	2¾ @ 2½¢
Horse-shoe Iron	"	3 @ 3½¢
Norway Nail Rods	"	4¼ @ 5¼¢
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	"	13 @ 14 ¢
Machinery Steel	"	8 @ 10 ¢
Cast Spring Steel	"	6 @ 6½¢
Homogeneous Steel Plate	"	7 @ 7½¢
Common Horse Nails	"	13 @ 16 ¢
R. R. Spikes, 5½x9-16		2¾¢ @ 2¾¢
Perkins' Horse shoes, ₱ keg of 100 lbs.		$3.62½
" Mule shoes		4.62½

	10	9	8	7	6
Putnam Horse Nails ₱ lb	18	19	20	21	23¢
Globe Horse Nails ₱ lb	18	19	20	21	23¢

Less list discount to the trade.

Messrs. R. C. HOFFMAN & Co., Iron and Commission Merchants, No. 23 South Frederick street, report the Pig Iron market as follows, under date of Feb. 3.: The demand for Wheel Irons continues very fair for the season, and as the stocks on hand are running very low prices have an upward tendency. We quote:

Baltimore Charcoal Wheel Iron	$26.00 @ 28.00
Virginia " "	26.00 @ 30.00
Anthracite No. 1	19.00 @ 20.00
" No. 2	18.00 @ 19.00
" No. 3	16.00 @ 17.00
" Mottled and White	15.00 @ 14.00
Charcoal, C. B. Blooms	50.00 @ 52.00
" " Billets	52.00 @ 55.00
Refined Blooms	43.00 @ 45.00

LOUISVILLE.

Messrs. GEO. H. HULL & Co., under date of Feb. 3 write us as follows: The demand is improving. Prices are firm, and we look for a further advance soon. The usual time, 4 months, is allowed on the quotations below:

FOUNDRY IRONS.	
No. 1 Hanging Rock, Charcoal	$21.00 @ 22.00
No. 2 " "	19.00 @ 20.00
No. 1 Southern, Charcoal	18.00 @ 18.50
No. 2 " "	16.50 @ 17.00
No. 1 Hanging Rock, Stonecoal and Coke	19.00 @ 20.00
No. 2 Hanging Rock, Stonecoal and Coke	18.00 @ 18.50
No. 1 Southern, Stonecoal and Coke	18.50 @ 19.00
No. 2 " "	17.50 @ 18.00
"American Scotch"	18.00 @ 19.00
Silver Gray	16.00 @ 17.00
MILL IRONS.	
No. 1 Charcoal, Cold-short and Neutral	16.50 @ 17.00
No. 1 Stonecoal and Coke, Cold-short and Neutral	16.50 @ 17.00
No. 2 Stonecoal and Coke, Cold-short and Neutral	15.50 @ 16.00
No. 1 Missouri and Indiana Red-short	20.00 @ 21.00
White and Mottled, Cold-short and Neutral	14.50 @ 15.00
CAR WHEEL AND MALLEABLE IRONS.	
Hanging Rock, Cold-blast	29.00 @ 33.00
Alabama and Georgia, Cold-blast	28.00 @ 29.00
Kentucky, Cold-blast	25.00 @ 30.00

W. B. BELKNAP & Co., Iron and Steel merchants, No. 113 and 115 West Main street, under date of Feb. 3, write that trade continues to increase slowly but steadily. There is no doubt that nearly all the mills are doing a larger business than ever before, but doing it quietly and in the entire absence of any excitement or tendency to speculation. The unfavorable revelations of most balance sheets for 1878 have much to do with the present stiffness of prices for Manufactured Iron and Nails, yet the prospect of an advance seems to have no stimulative effect upon purchasers. In spite of confidence in the future of prices, and in spite of a plethoric money market, there is no revival yet of the spirit of enterprise. The fact, however, that trade is so large as it is, in spite of its hand-to-mouth character, is full of encouragement. There is room for immense improvement, and reason for believing that it will not be long delayed.

CINCINNATI.

Messrs. E. L. HARPER & Co., under date of Feb. 3, write us as follows: There has been somewhat of a lull in the demand of the week past, but the volume of trade is still fair, and there is no apparent change in the hopeful feeling of a better year's business. While there have not been any large buyers in the market, sellers generally have no very large lots for sale, many having booked orders at full prices, covering a considerable proportion of their make for some months to come. A large demand, such as is usual in the spring, will be very apt to produce a decided scarcity of desirable grades. Quotations unchanged:

HOT-BLAST FOUNDRY.	
Hanging Rock C. C., No 1	$21.00 @ .....
" C. C., No. 2	19.00 @ 19.50
Alice, No. 1 Extra, I. M.	..... @ .....
" No. 1 " N. O.	20.00 @ 20.50
" No. 1, N. O.	19.00 @ 19.50
Hanging Rock Coke and S. C., No. 1	15.00 @ 19.00
" " S. C., No. 2	14.00 @ 17.00
Virginia Coke, No. 1	18.50 @ 19.00
" No. 2	17.50 @ 18.00
Shawnee S. C., No. 1	18.50 @ ...
" S. C., No. 2	16.00 @ 16.50
Hocking Valley S. C., No. 1	18.00 @ 19.00
" S. C., No. 2	16.00 @ 17.00
FORGE IRONS.	
Hanging Rock, No. 1 C. C.	18.50 @ 19.00
Hanging Rock, No 1 Coke	16.50 @ 17.00
Longdale, No. 1 Coke	17.00 @ ....
Ala. and Tenn. No. 1 C. C.	17.00 @ ....
Red-short, No. 1 Coke	18.50 @ 19.50
Cold-short, No. 1	15.50 @ 16.00
Old Rails, prime	cash, ... @ .....
CAR WHEEL AND MALLEABLE.	
Hanging Rock C. B	30.00 @ 31.00
Cherokee C. B	28.00 @ .....
Southern and Western Brands	27.00 @ 28.00

ST. LOUIS.

G. A. MILLARD, under date of Feb. 1, writes us as follows: The market continues fairly active, but prices remain firm. In absence of any material change I quote:

CHARCOAL.	
No. 1 Hanging Rock	$23.00 @ 24.00
No. 1 Tennesse and Alabama	21.00 @ 22.00
No. 1 Missouri	20.00 @ 21.00
COKE.	
No. 1 Hanging Rock	$21.00 @ 22.00
No. 2 " "	20.00 @ 21.00
No. 1 Tenn., Ala. and Ga.	20.00 @ 21.00
No. 2 " "	19.00 @ 20.00
FORGE IRON.	
No. 1 Tenn., Ala. and Ga.	$17.00 @ 17.50
No. 1 Missouri	17.00 @ 17.50
COLD-BLAST CAR WHEEL.	
Hanging Rock	$32.00 @ 35.00
Tenn., Ala. and Ga.	28.00 @ 30.00
Missouri	28.00 @ 30.00
SILVER GRAY.	
Hanging Rock	$17.00 @ 18.00
Tenn., Ala. and Ga.	17.00 @ 18.00
Old Rails, gross	21.00 @ 22.00
Old Car Wheels, gross	20.00 @ 21.00

RICHMOND.

Mr. ASA SNYDER, Iron Merchant and Furnace Agent, writes as follows under date of Feb. 3: This market continues gradually to improve in demand for Foundry Pig Iron; Old Rails and Wrought Scrap are weakening. I quote as before:

American Scotch Pig Iron	$21.50 @ 22.50
Anthracite, No. 1	19.00 @ 20.00
" No. 2	18.00 @ 19.00
" No. 3	17.00 @ 18.00
" Mottled	14.50 @ 15.50
Coke, No. 1	19.00 @ 20.00
" No. 2	18.00 @ 19.00
" No. 3	16.50 @ 17.50
Va. Cold-blast Charcoal, Cold-short	20.00 @ 23.00
Va. " " Neutral	27.00 @ 28.00
Va. Warm-blast " Cold-short	18.00 @ 21.00
Va. " " Red-short	17.00 @ 18.00
Old Rails	17.50 @ 18.50
Wrought Scrap No. 1	17.00 @ 18.00
Cast " (machinery)	15.00 @ 16.00
Richmond Refined Bar Iron	2c. @ ....
Horse Shoes per keg	... @ 4.00
Mule " "	.... @ 5.00
Old Dominion Nails, Standard Size, ₱ keg	2.25 @ ....

Freights to Philadelphia, $1.40 per ton of 2240 lbs., by sail.

Freights to New York, $1.60 per ton of 2240 lbs, by sail.

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels.)

PARIS, Jan. 18, 1879.—*Metals.*—The metal markets have been irregular in the extreme, and a week or so will probably elapse ere they settle down to greater stability. *Copper* has been very quiet, and prices have receded 1.25 on Chili Bars and Best Selected, and 2.50 on Ingots. We quote to-day, first brands Chili Bars, deliverable at Havre, 157.50 francs the 100 kilos; Common do., 152.50; Ingots and Slabs, 157.50; Best Selected, 162.50; Corocoro Ore, 160; Sheathing, 180, and Yellow Metal do., 170. Havre is nominal; they quote: First brands Chili Bars, 153.75; good current ditto, 151.25, and Lota and Urmeneta, 150. At Marseilles the market is weak and has declined 5 francs; they quote small Refined Ingots, 165; Sheathing, 180 @ 185; Sheet Copper for Boilers, 180; Bolts, 190; and Yellow Metal Sheathing, 170. *Tin.*—Billiton has improved 1.50, while Straits and Australian have declined 1.25. We quote here: Banca, deliverable at Havre or Paris, 177.50; Billiton, 172.50; Straits, 165; Australian, 165; and English, at Havre or Rouen, 166.75. Marseilles has given way between 2 and 2.50 francs the 100 kilos; they quote: Banca, 165; Straits, 160; French, 170; and English, 168. *Lead.*—This metal remains weak at a decline of 50¢ in this market. We quote the various sorts, deliverable at Havre, 37 francs the 100 kilos, and at Paris, 37.50; Sheet and Pipe, 50. At Havre, First Fusion Soft Spanish commands 38 @ 39 francs. At Marseilles copious arrivals of Spanish keep the market depressed. They quote Argentiferous 36 francs the 100 kilos; First Fusion Soft, 35 @ 35.50; Second ditto and Antimonious, 35; Sheet and Pipe, 40, and Shot, 40.50. *Spelter.*—There is no change here. We quote Silesian at Havre, 44; other good brands at Havre or Paris, 44; Vieille Montagne Sheet, 60; Royal Asturian, 60; and Biache St. Waast, 58. There has been a 2-franc decline at Havre, where Silesian is now worth 43 @ 44 francs the 100 kilos. Marseilles is steady. They quote Vieille Montagne Sheet, 56.50; other brands, 55, and Old Remelted, 30 francs the 100 kilos. *Iron.*—Our market is looking up and dealers here have received a good many orders. This is not yet a revival such as we need it, but if the same amount of activity continues to the 1st of March everybody will have reason to be satisfied. The Northern forges now begin to ask 145 francs for Merchant Iron for anything short of 50 to 100 tons. In the Ardennes orders have been received from the artillery and railroads, and there is also a good demand for Nails. The latter, in part made by hand in the district, had come down to a low figure, but are now looking up again. In the Haute-Marne prices are upheld with difficulty, and production will have to be curtailed. The amount of Iron Ore shipped to Marseilles and thence forwarded inland has been 282,409 tons in 1878, against 340,298 in 1877 and 385,165 in 1876. In the northern department Iron is still declining, and consumers of Iron are hesitating in the face of this drooping attitude of the market. Coarser kinds of hardware are slow of sale. Wages of operatives employed in this branch have gradually receded some, 25 % since 1872. About half of the operatives of the Providence forges at Haumont had struck for higher wages, but the company not feeling disposed to submit to their dictation, they have been replaced by workmen from other quarters, and those dismissed are now ready to resume work. In the Rhone and Loire Basin activity has been impaired by the snow fall, and the mail from Paris and the North has been considerably delayed. The Alsatian Company of Mulhouse has resolved to move to Belfort, and there to erect its new establishment on French territory. This resolution, we hear, has been arrived at in view of the proposed tariff modifications in Germany, the said company having done its largest trade in the way of export to France, and believes to do better in France in the future. The shares of the Terrenoire Works have of late been declining in a rather striking manner. The result of the company's labors in 1878 are not yet known. *Coal.*—The return of cold weather keeps up a fair amount of activity, and prices are sustained.

BELGIUM.

(Revue Universelle.)

BRUSSELS, Jan. 19, 1879.—*Iron.*—The result of the week's adjudications furnishes proof of the continued weakness of prices, and the best combinations to uphold the latter are set at naught by the instability of the market. The consolation that surrounding industrial nations are no better off in this respect is but a poor one. It would be far more welcome if a general revival manifested itself. Mr. C. Bonehill has resumed the management, for his own account, of the Marchiame rolling mills, which shows that some of our makers have confidence in the immediate future, the said works having been formed into a company previous to this resumption of its original ownership. The Roumanian government stands in need of Steel Rails and other railroad material, to be adjudicated upon at Galatz. Belgian makers are likely to compete for this job. Our German neighbors have submitted the lowest tenders for the furnishing of railroad cars in Holland. The Rhenish Railroad stands in need of some Steel Rails, and next month the Alsace-Lorraine Railroad Company will acquire a similar lot, all by adjudication. At Stettin the Pomeranian Railroad Company will require Rails and railroad material to be passed upon this month. There are, consequently, a good many opportunities at hand for our makers to come in for a share of work, if prepared to accept the low prices current. *Coal.*—There is a brisk demand since the weather has become colder again. The chief engineers have reported to the government the result of their Coal statistics, now completed for the years 1877 and 1878. The number of Coal companies in activity in Belgium in 1878 was 161, against 164 in 1877. Last year 292 mines were being worked by them and 383 unproductive, against 287 in operation and 370 inactive in 1877. The number of miners was 98,000 in 1878, against 98,500 in 1877, and their average daily earnings in 1878 were 2.86 francs, against 3.08 in 1877.

GERMANY.

(Borsenhalle.)

HAMBURG, Jan. 18, 1879.—*Metals.*—The German markets have still remained very quiet, and fluctuations have been unimportant. *Copper.*—Very little has transpired, and prices are unaltered here and at Stettin. Berlin is steady, quoting good qualities English and Australian 63 @ 68 marks the 50 kilos., and Mansfield, 67.50 @ 68. *Tin* has been weak. There is no change to be reported from here and Stettin, but Berlin quotes Banca 69.50 @ 70 marks the 50 kilos. and English, 67.50 @ 68. *Lead* has not escaped the effect of the weakness in England and France, where Spanish is again making its appearance in larger quantities, while production is being kept up in this country unabated. There has been no alteration at Stettin and in this market, while Berlin quotes lower prices, Tarnowitz, Hartz and Saxonian having given way to 14.50 @ 14.75 marks the 50 kilos. *Spelter.*—This metal forms an exception to the general rule, and exhibits greater stiffness. This is due in the first place to the firm attitude of principal holders at Breslau, the comparatively moderate stocks in second hands and those of consumers, and the approach of the more active season for this metal which, with some increase in the demand, would be susceptible of improvement, considering the moderate prices ruling. No actual advance can as yet be advised either from Stettin or from here, but Berlin has begun to look up, and quotes good brands Silesian 16.75 @ 17.50 marks the 50 kilos.

HOLLAND.

(Koch & Vlierboom.)

ROTTERDAM, Jan. 14, 1879.—*Tin.*—The price of Banca has, during the past few days, dropped to 37 guilders the 50 kilos, and Billiton to 36. The Netherland Trading Society will sell, at public auction, on the 28th instant, 22,900 blocks of Tin, 3,400 of which Billiton and the rest Banca. The following has been the movement in Billiton Tin:

	1878.	1877.	1876.	1875.	1874.	1873.
Import	109,345	97,700	105,789	84,961	84,856	75,567
Sales and transit	94,820	89,309	104,849	86,485	78,470	64,700
Stock Dec. 31	57,912	38,510	30,619	29,679	31,606	25,720

Lead.—The course of Lead prices in Holland during the past twelve months has been an uninterrupted downward one, and the dealings have been comparatively light. Stolberg, which, a year ago, commanded 11½ guilders the 50 kilos, is now worth 8⅞ guilders and no more. There have been imported into Holland in 1878 of German and Belgian Lead 42,000 pigs, against 36,900 in 1877, and 37,200 in 1876. The stock December 31, 1878, was 6600 pigs, against 5600 in 1877, and 2000 in 1876.

EAST INDIES.

(Gilfillan, Wood & Co.)

SINGAPORE, Dec. 19, 1878.—*Tin.*—Last week there was little demand and prices touched $18.50 per picul; since then, however, the demand for the United States has improved, and the market closes at $19 per picul, buyers, but no sellers. The exports to New York during the past fortnight have been 140 tons by direct steamer Glenartney and 30 tons by steamer via Liverpool. *Tonnage.*—There is no change in the position of the market, 20/ having been paid for ordinary cargo to London, but until cargo becomes more abundant, particularly light cargo, and seeking ships less numerous, we cannot look for any marked improvement. For New York, the Mohican and Charles Luling are still in want of cargo. For Boston there have been no charters. The shipments of Tin to the United States from the Straits settlements during the eleven months ended November 20 have been 58,735 piculs, against 58,043 in 1877; 49,636 in 1876; 53,958 in 1875; 35,987 in 1874; 37,095 in 1873; 57,512 in 1872; 49,072 in 1871, and 55,073 in 1870. *Exchange* has declined to 3/8⅞ for six months' sight credit drafts on London.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

LONDON, ENG., January 20, 1879.

THE MONEY MARKET

has been eased to the extent of 1 per cent. during the past week, owing to the accumulation in the reserves of the Bank of England, but there is still some uneasiness in financial circles, whereby the beneficial effects of the increased cheapness of money have been prejudiced. As one symptom of the state of incertitude in which we exist at present, I may cite the "run" which was popularly understood to have been in operation on Friday on the London and County Bank. Early in the day I heard of the so-called panic, and later on I found that part of Lombard street quite impassable, as it remained all day long and late into the evening. This morning it is explained that all this fuss and trouble arose out of the differences of a country party, consisting of seven or eight persons, who had been to cash a legacy cheque and quarrelled outside the bank as to their respective shares. This quarrel attracted a few idlers; a crowd soon gathered; it was whispered that the "County" was shaky and that there was a run; the rumor spread, and in an hour afterward Lombard street was blocked to the extent I have stated. This explanation is, I think, true, but the mischief of the thing is that people are so suspicious just now that the run may assume serious proportions, and the institution be crippled or even stopped thereby. This want of confidence is so prevalent that the London and Westminster Bank—which holds deposits in excess of even the Bank of England—has during the past few weeks had £5,000,000 of deposited money withdrawn. It yet holds over £21,000,000 on deposit, most of which is at call—a terrible responsibility in case of a panic.

BUSINESS GENERALLY

does not improve, albeit we hear of slight spurts here and there. There is little or no speculation in any branch, and the current reports from some of the more distant markets of South America and Asia, do not yield much hope of their demands being increased. On the Continent matters appear to be quite as bad as they are here—indeed, in certain parts of France, Belgium and Germany the distress among the workpeople is said to be increasingly severe. People are beginning to entertain the idea that there is about twice as much capital engaged in the iron trade as there ought to be, and that, until something like half the total number of manufacturers are ruined or otherwise weeded out, a revival will be impossible. The extended use of steel, say some, renders renewals and alterations absolutely unnecessary for a long series of years—and will always do so—hence the wants of the world will be enormously reduced. In this crude idea there is a fair substratum of truth. Steel is steadily, regularly and largely replacing iron and iron products of almost every kind. Steel lasts three to six times as long as iron; therefore, by the adoption of the former—leaving out the question of costs—must of necessity not only destroy the iron-workers' prospects, but must also effect a minimization of the demand for steel and iron conjointly, precisely in the same proportion as the lasting properties of steel are in excess of those of iron. I have not tried how this would work out by Rule of Three, or as an algebraic proposition, but I think it is practically "about right." Starting from the groundwork thus afforded, an ingenious writer might easily weave an exceedingly plausible network of theories to account for the depression now existing; but not being given to abundant theorizing, I must personally decline the temptation. I hear that Prof. Fawcett's recent article on our trade is likely to be roughly handled in a leading magazine next month.

THE GREAT LOCK QUESTION

has materially assisted in filling the newspapers since the date of my last letter. Mr. Hill's letter was copied in full by many of the principal provincial journals, several of which also commented on the various points raised. The English manufacturers have not been slow to defend themselves, two or three general letters having been addressed to the *Times* and others to the *Ironmonger*. It is in the communications forwarded to the latter prominent trade journal that most interest centers, seeing that they are signed by the leading Willenhall firms, and go very fully into the subject in its practical details. They press Mr. Hill very closely on some points, and one of the writers (Mr. Vaughn) makes a series of assertions relative to American locks which, if not at once refuted, will most effectually damn your locks in this market forever and a day. In support of the statement that your locks are not intended to provide secure fastenings, but simply an "indication of privacy," Mr Vaughn quotes Mr. Littlejohn, of Mallory, Wheeler & Co., New Haven, and Mr. Kennedy, in the following terms: "Last summer we had the pleasure of conducting Mr. Littlejohn, of the firm of Mallory, Wheeler & Co., of New Haven, over our works at Willenhall. After what he saw, he expressed surprise that the American locks should sell at all in our market. I pointed out to him the insecurity of their locks, and he admitted that in his country the bulk of the locks were not made to prevent burglaries, but that if a person tried a door and found it apparently fastened, this was an intimation to him that the place was private, and he must not use force to obtain an entrance. Further than this, he admitted they had no regard for security. Mr. Kennedy, of the Branford Works, near New York, also paid us a visit, and he confirmed the statement made by the other gentleman. I merely give these instances as being demonstrative of the opinion the Americans have, and freely express, of the handicraft of their own countrymen." I should suppose that our friend Littlejohn will have something to say about this. At the war office, and also in other Government departments, quite a flutter is said to exist on the subject, some of the officials having suddenly become shocked (so I am told) at the idea of American-made locks having been adopted in buildings belonging to the nation! How these gentlemen have been converted I don't profess to know, but I know that the whole system of government contracts in this country is a huge and unblushing piece of deceptive effrontery—in short, most of these contracts are "examples of dexterous management." I don't allude to any particular case or department—all are alike.

FREE TRADE OR RECIPROCITY

continues to be a fruitful theme, hardly any speaker of note having of late avoided it. It is only fair and just to say that the majority appear to be distinctly in favor of free trade, but the reciprocity theory is largely supported by the commercial classes. In the city of London 239 merchants and others (including several members of Parliament) have signed a requisition to the Lord Mayor, asking him to convene a public meeting to discuss the causes of our declining commercial prosperity, with a view to inducing the government to inquire into our "so-called" free-trade theory and system. At the forthcoming meeting of the Associated Chambers of Commerce, there will be a discussion on sundry matters incidental to both sides of the question. The Rt. Hon. W. E. Forster is to deliver a special address to-night at Bradford on them. It thus appears that we are not likely to stick fast for lack of ample information. Every day brings encouragement to the advocates of reciprocity, in the shape of renunciations of commercial treaties with us or with each other by Continental (by which I mean European) nations, and the constantly growing imposition of prohibitive tariffs. Despite this, however, the free traders maintain a very bold and confident front.

THE SCOTCH PIG IRON MARKET

has been quiet. Messrs. William Colvin & Co. and James Watson & Co. report a dull market, with no improvement in prices. Shipments are on a small scale—totals being slightly under those of last year. Stocks are very heavy all round, and there is no relaxation of the keen competition with the Cleveland houses. Scotch makers' brands are weak.

THOMAS W. BOOKER & CO. (LIMITED).

This well-known Welsh iron and tin-plate concern has just been ordered to be wound up by Vice Chancellor Malins, the total liabilities being understood to be about £600,000, of which much more than £20,000 was owing to the now defunct West of England Bank. In 1875 the company paid a dividend of 7 per cent, and at the present time there are considerable contracts in course of execution. Work will be continued on these until they are completed.

THE BLAENAVON IRON AND STEEL COMPANY

also a Welsh establishment of note, has also fallen into the hands of the Vice Chancellor, who has decreed that it shall be wound up, as prayed by Messrs. Kinnaird & Warnig, creditors for over £380,000. The company was originally formed in 1798, although the iron mines are believed to have been worked for many hundreds of years prior to then. At the present time there are over 5,000 persons employed in the mines and works, and their services will be retained during the winding up. Should the place come to a standstill, the whole neighborhood would experience a crushing and ruinous blow.

THE ROSEDALE AND FERRYHILL IRON COMPANY (LIMITED)

has stopped payment to-day, very much to the surprise of some, but in accordance with the expectation of others. There was a rumor of difficulties several months ago, in connection with the name of a certain North of England member of Parliament, who was then retiring from the concern. It is stated that the assets are over £350,000, as against £280,000 of debts, so that there would seem to be a chance of the creditors getting 20 shillings in the pound. The chief offices of the company are at Middlesborough, and it was formed into a "limited" in 1864, with a capital of £754,000. The then chief partners were James Morrison (of Newcastle, Stavely, &c., sometimes called the Great Rokewaster); Alfred Allott (then of Sheffield, now of London, a great company promoter, who himself failed for over £250,000 three years ago, owing to over-speculating in Tennessee coal and iron lands); George Leeman, M. P. (of York, chairman of the Northeastern Railway Company); Isaac Hartes (of Kirby Moorside), and A. C. Sherriff (of Worcester). James Morrison died last February, and with his loss the concern has apparently gone from bad to worse, until at length accumulated debt and the non-revival of business have culminated in the suspension. The company own large ironstone deposits and mines at Rosedale in North Yorkshire; the South Kirby colliery, near Barnsley, in South Yorkshire; the Thristington colliery, in Durham, and the Ferryhill Iron Works, with ten of the largest blast furnaces in the country. Several of these furnaces are over 100 feet high. Ferryhill pig sold better than most of the Cleveland brands, and the company had agents at Sheffield, Manchester, &c. The mines and collieries, however, were too far from the furnaces—*hinc illæ lacrimæ*. A Newcastle bank is "in" for over £60,000.

FROM SHEFFIELD

current tidings are decidedly blank, save one little item of home comfort, in the shape of a statement that a very fair amount of business in all kinds of cutlery is being done with the United States. The demand, I am told, comes chiefly from the Southern and Western States, and is being mostly supplied by Geo. Wostenholm's, Jonathan Crooker, John Wilson, J. Rodgers & Son, as well as by Frederick Ward, Arthur Lee and other factors. At the same time, Sheffield is rather discouraged by the report of Dr. Webster, the American Con-

sul there, showing the great increase in the importation of American goods into the town.

WAGES DISPUTES

are becoming uncomfortably numerous, although some of the larger ones have, for the time being, been smoothed over. The Midland Railway Company have beaten their guards. The iron trades employers in London, Liverpool and Huddersfield are endeavoring to secure lower wages, leaving the question of hours as before. The arbitration in the Northern iron trade has awarded a reduction of 6/ per ton on puddling and 5 per cent. on all other wages—to date back from December 2. In the wire trade the drawers remain out, but the employers are stated to be engaging substitutes at the new rates of remuneration.

BIRMINGHAM AND STAFFORDSHIRE

are unfruitful in respect of news. Most of the iron works proper are doing very little, and prices are weak, although nominally unchanged on the basis of my last week's quotations. In the lighter industries, especially those peculiar to Birmingham itself, there is rather more work in hand, mostly in fulfillment of Australian, New Zealand, Cape, South American and West Indian orders. From Australia comes the news that American goods are mostly losing somewhat of the hold they had secured, with the exception of electro-plated wares, in which your agents are stated to be fairly busy. The Sheffield and Birmingham houses are not idle, however, for I hear that two or three additional agents have just been dispatched to the antipodes. It is interesting, just now, to note that there has been an increase during the year of about 7 % in the amount of business between Birmingham and the United States.

SOUTH WALES AND MONMOUTHSHIRE

are dull, as may be inferred from some of the foregoing paragraphs. The only item of note appears to be that Dowlais has taken a German order for 2,000 tons of steel rails. So far I have not seen the competitive prices quoted.

THE METAL MARKETS

have not changed very materially during the week. The periodical report of the *Ironmonger* is as follows: *Copper* opened steadily on Monday, on which day Chili charters for the first half of January were advised as being 1850 tons bars, and 50 tons fine in ores and regulus for the United Kingdom. Business was done in Chili bars at £65. 15/ for G. O. B., and £57 for named; Wallaroo, £67 @ £67. 10/; Burra, £64. 10/; English tough, £62 @ £63; best selected, £63 @ £64; strong sheets, £67 @ £68, and india sheets, £67. These figures have ruled during the rest of the week. On Wednesday about 580 tons of Cape ores sold by tender at about 10/11 per unit for 34 % produce. *Tin* has been quoted at £59. 15/ @ £60, cash, for fine foreign, and a few transactions for arrival have taken place at £59. 10/. English ingots steady at £63 @ £64. During the week there have been imported 5937 ingots from Melbourne in the Loch Katrine, and 4724 slabs in the Antenor from Penang. *Lead* remains dull and prices rule in favor of buyers, quotations still being £14. 2/6 @ £14. 5/ for English pig, and £14 for soft Spanish without silver. *Tin Plates* are quite firm, a disposition to advance prices being even observable here and there. So long as the American demand is upheld there is little chance of any reduction. The restricted production is apparently being faithfully carried out. *Zinc* has been disposed of at public sale at £19. 12/6 ₱ ton for 40 tons net at works. *Spelter* is unchanged at £16. 5/ @ £16. 10/; *Quicksilver*, £6. 7/6; and *Antimony*, £47. 10/.

The official report of the London Metal Exchange was: "*Copper.*—Steady at £57 for G. O. B. Chili Bars on the spot; Wallaroo, £67; Burra, £64. 10/; English tough, £62 @ £62. 10/; best selected, £63 @ £64; strong sheets, £67. *Tin.*—Quiet, with small transactions on the spot; in fine foreign on the spot, £59. 15/; English ingots, £63 @ £64. *Iron.*—Scotch pigs, 42/8 @ 42/7, cash. *Lead.*—English pig, £14. 2/6 @ £14. 5/; soft Spanish, without silver, £14. *Spelter*, £16. 5/ @ £16. 10/ for ordinary brands. *Zinc.*—No quotations. *Quicksilver*, £6. 7/6. *Antimony*, £47. 10/.

INDUSTRIAL ITEMS.

VERMONT.

A committee of the stockholders of the St. Albans Iron and Steel Works, which have been closed for some weeks on account of financial difficulties, have finally agreed to issue the company's notes for $120,000, to run five years, bearing 6 per cent. interest, payable semi-annually. These notes are to be taken by the creditors, so far as they will go, for present obligations. It is intended to borrow of stockholders $30,000 in money on the same terms for a working capital; to issue to Philo Remington, of Ilion, N. Y., $64,000 worth of stock for a patent which he put in when the company was formed, and for which he has never been paid; to discharge all mortgages, settle all suits and leave the property free from any lien or incumbrance whatever. The company owe $130,000 and have personal property assets of $57,000.

MASSACHUSETTS.

Emerson & Stevens's scythe manufactory, at West Waterville, was burned last week; loss, $20,000; insurance, $10,000.

The long unused Shawmut Iron Works near the West Boston bridge, Cambridge, are about to be reopened by the American Steam Safe Company. The buildings are being strengthened and repaired, and it is said that fifty men will find employment there at an early day on a six months' contract.

At the annual meeting of the American Tack Company, of Fairhaven, Oliver P. Brightman, J. A. Beauvais and Loum Snow, Jr., of New Bedford, and C. D. Hunt and L. S. Judd, of Fairhaven, were chosen directors. Mr. Beauvais was re-elected clerk and treasurer, and was also chosen president, in place of O. E. Brigham, of Boston, who declined re-election.

The present condition of the industries of Somerset is as follows: The works of the Mount Hope Iron Company are running nearly all the time. The works of the Co-operative Foundry Company are stopped for their annual stock-taking, but will soon resume operations. The works of the Somerset Iron Company are in a quiescent state. William Homer for the past eleven years the agent of the Co-operative Foundry Company, and J. G. Tinkham, for the past nine years the head clerk and bookkeeper at the works of the Somerset Iron Company, have formed an association and leased the foundry of the Taunton Cotton and Machine Company, Taunton, and will at once commence manufacturing stoves and other castings at that place.

The Chapman Cutlery Works, of Holyoke, have New York contracts which will keep them on full time until March. They have 22 hands, turning out 20 gross per day of common table knives and forks.

The Fitchburg Steam Engine Company, of Fitchburg, are busy on their well-known steam engines, and looms for narrow goods. The works are running on full time, with nearly a complement of hands. They have orders on hand now for twelve engines.

Messrs. Buttrick & Wheeler, of Worcester, inform us that they have contracted to locate, construct and equip the Magdalena Railroad, in the United States of Colombia (South America), which is to be about 33 miles in length, around the rapids of the Magdalena River, 500 miles from its mouth. It is designed to connect the navigation of the upper and the lower part of the river. It is expected that the contract will be finished in about one year from April 1, 1879.

Jerome Wheelock, of Worcester, who obtained a grand prize, 3000 francs and a work of art, at the Paris Exhibition for his celebrated improved variable cut-off engines, has been favored with an influx of orders for foreign countries. He has just sent a 50-horse engine to Japan, and is now building one to go to Manchester, England. He has recently set up a 500-horse engine in Newburyport, for the Peabody Mills.

The Worcester Machine Screw Company, established in 1867 as A. W. Gifford & Co., and in operation since 1872 under the present style, manufacture screws for all classes of agricultural implements, machinists' tools, steam engines, sewing machines, &c., and employ about 40 hands. They use several hundred machines, mostly automatic, and expect, by the aid of additions in contemplation, to double their producing capacity. They control valuable patents in screw machinery.

We learn upon inquiry that the rumor, noted in our last week's issue, respecting the intentions of the management of the Parker Mills, has no foundation in fact.

CONNECTICUT.

The following directors were elected at the annual meeting of the Bridgeport Brass Company: William H. Davol, Frank H. Davol, John J. Williams, Daniel W. Kissam. At a subsequent meeting of the board the following officers were re-elected: President, W. H. Davol; treasurer, Samuel Holmes; secretary, D. W. Kissam. The business of the company is prosperous and the stockholders received a dividend.

The stockholders of the Howe Sewing Machine Company held their annual meeting at Bridgeport, and found the affairs of the company in a good condition, with a prospect of an increased business during the coming year. The following directors were elected: John P. Kennedy, C. A. Avery, James A. Staples, L. S. Stockwell. At a subsequent meeting of the directors, John P. Kennedy was elected president, C. A. Avery treasurer, and E. Parmly secretary.

The Cartridge Company at Bridgeport have sent seventy-three car loads of shells and bullets to New Haven, to be shipped on the steamer Norman Monarch to Turkey, which completes their share of the cargo. The seventy-three car-loads were made up of 15,000,000 primed cartridge shells and 15,000,000 bullets. The shells are loaded in Turkey for the sake of economy, as the powder can be obtained there as cheap as here, if not cheaper.

Messrs. Barnum, Richardson & Co. have been semi-officially informed by Mr. Pickering, commissioner, that they have been awarded at the Paris Exhibition a gold medal for their exhibit of Salisbury iron ores, and a bronze medal for their exhibit of Salisbury car wheels.

After a stop of three weeks, the American Pin Company, of Waterbury, are again in full operation, turning out 6,720,000 pins per day, with 80 hands, on 50 machines. They make 100 different numbers of pins, among them four grades of the "Ne plus ultra."

NEW YORK.

Industrial operations have been resumed at the Bessemer Steel Works, Troy.

William F. Ilerr's wire mill at Troy is running full handed. This mill has been five years established for the manufacture of all grades of iron and steel wire, and its trade with New York, New England and the West is wide and growing. Large quantities of harvesters' band wire go to the West.

Torrence, Merriam & Co. have not shut down their large foundries at Green Island, opposite Troy, for lack of work for fifteen years. Fine gray and malleable iron castings are their product, including stove makers' supplies, carriage and harness makers' hardware, a great variety of small castings, &c. About one hundred hands are employed at these foundries.

A new wire mill has just been put in operation at Troy by John W. Griswold, son of the late Hon. John H. Griswold. Mr. Griswold occupies one of the old Marshall Mills, and is running on contract for a large supply of harvesters' band wire.

Thomas F. Rowland, of the Continental Works, Greenpoint, Brooklyn, has just closed a contract for a new pier and buildings for the Cunard Steamship Company, at Pier 40 North River. We understand that the expense is to be some $75,000.

During the great Worth street fire, much excellent service was done by the private fire brigades of the large mercantile houses who were supplied with Knowles pumps, manufactured by Knowles & Bro., whose works are at Warren. Their loom works at Worcester are being run on full time, giving employment to nearly 100 hands. They are now building 32 broad fancy cassimere looms to go into a new mill in New Jersey, and looms for different mills for the manufacture of fancy cassimeres, elastic webs, silk ribbons, &c.

DELAWARE.

The works of the Edge Moor Iron Company, situated on the line of the P. W. & B. R. R., near Wilmington, are now fairly busy. They are equipped with the most approved tools for the manufacture of bridge and turn-table work, and use for power the hydraulic pressure obtained from two accumulators. These are capable of varying the pressure from 500 to 4000 pounds per square inch. The riveting machines are driven by separate accumulators, at a pressure of about 1500 pounds per square inch. The power used for the shafting and the machine shops is obtained from a 70-horse engine, made at the People's Works. The punches and shears have long and carefully adjusted tracks, with suitable carriages. On the punches these carriages are fitted with gauging apparatus, by which distances between holes punched can be accurately determined, and work done at different times can be fitted together without injury to the rivets. Owing also to the facilities for passing work through the shears, the edge of such work presents a straight, unbroken line. The most improved machinery is also used in upsetting and forging the eye-bars, swivels, &c. The works claim to have punched 21,000 holes in 12 hours on a single machine; to have put the eyes in 100 bars, making 200 eyes, in 10 hours, and to have set 4000 rivets in the same time. They are now employing the electric light for illuminating their establishment, and consider it invaluable, especially in their location.

PENNSYLVANIA.

The Savage Fire-brick Works, at Keystone Junction, Somerset county, on the line of the Pittsburgh and Connellsville Railroad, are running double shift now, with more orders than can be filled. This firm ran time and a half during all the panic.

"Tubal Cain," in the Sharon *Herald* of the 31st ult., says: For the week ending Jan. 25, at the Westerman Mill—puddle, guide and hoop mill, double turn; bar and sheet mill, single turn; nail factory and plate mill on five days; railroad spike machines on; chain factory working all its fires, and getting no stock ahead of orders. At Kimberly, Carnes & Co.'s mill—puddle, guide and old hoop mill, double turn; bar and new hoop mill, single turn; plate mill and nail factory, five days. At West Middlesex six furnaces went on Thursday, single turn. Mr. Bradley contemplates making steel here direct from muck bar. He says that he can produce a steel that will bear a pressure of 100,000 pounds to the square inch. All the blast furnaces that are in are doing well. Westerman No. 2 is making about 225 tons a week of No. 1 mill. Keel Ridge about 218. They are now using Republic ores, and may shortly increase the product. Stewart No. 1 is making about 330 tons a week of No. 1 Bessemer. Fanny Furnace, in Middlesex, about 300 tons, Bessemer principally. The two ins in Sharpsville are working up to their general average.

The Pennsylvania Lead Co. are operating their works at Mansfield to full capacity. On one day recently they shipped about $6000 worth of silver to New York.

An Erie paper says: The firm of F. F. Adams & Co. have increased their capital stock to $100,000, taking in the firm Mr. Charles W. Farrar, of Pittsburgh. New machinery will be added immediately.

The steam forge of the Reading Iron Works is busy at present on work for P. L. Weimer & Co., Lebanon.

A portion of the work for the New York Elevated Railway, contracted for by the Phœnix Iron Company, will be done at McIlvain's rolling mill, Reading.

The Monocacy Furnace turned out 164 tons of iron week before last, 90 per cent. of which was No. 1.

Messrs. E. & G. Brooke, Bridsboro, have an estimated stock of 17,000 tons of pig iron on hand.

At the sheriff's sale of the personal property of the Lehigh Valley Iron Company, held at the works at Coplay, the locomotives, cars, ores, limestone, coal, tools and nearly all the other personal property was purchased by Mr. Aaron Balliet. The employees have a priority of claims on the funds realized, and they will all be paid promptly.

The new extension to the Philadelphia Bridge Works, in the eastern end of Pottstown, is gradually assuming shape. The building, which is frame, with the exception of the north side, which is brick, is ready for slating and weather boarding. The dimensions of the building are 120 by 205 feet, making the total length of the works about 485 feet.

The blacksmiths in the P. & R. shops, Reading, are working now from early morning until midnight. Work is plenty in that department.

Allentown *Item* is informed that at a meeting of the stockholders of the Allentown Iron Company in Philadelphia, it was decided to continue operations as conducted at present; that the stockholders contribute funds to free the company from its financial embarrassment, and resume operations in the furnaces now idle as soon as practicable.

Eight of the puddling furnaces in the old mill, South Bethlehem, were started up Sunday evening. The *Times* says: The old stirrers of the boiling metal have been gathered from all around, and it does an old employee's heart good to see the old faces beaming at the prospect of steady work. The starting up of these furnaces give employment to about 100 men or more, and is a hopeful "sign of the times."

Mr. John Birkinbine, late of Weimer & Birkinbine, Lebanon, Pa., has, we learn, assumed the general management of the South Mountain Mining and Iron Company, whose iron works at Pine Grove were established in 1770, and which have, with but few interruptions, been operated to the present time, turning out a superior quality of charcoal pig and neutral blooms for plate iron.

PITTSBURGH AND VICINITY.

There are but three of the twelve blast furnace stacks in Pittsburgh out of blast—one Eliza, and the other two Superior.

The Escanaba Furnace, which was removed from Michigan by the Edgar Thomson Steel Company, will be ready to blow in some time in March.

The Baldwin Carbon Bronze Company have begun the manufacture of bells from carbon bronze. The tone is very clear and penetrating.

The Solar Iron Mills, Pittsburgh, started up last Monday morning with eight furnaces in operation. The puddlers put to work, as well as the force of muck-rollers, are non-union men, with one exception. The firm expects to have all departments of the mill in operation in a few days.

Two of Painter & Sons' hoop mills have commenced running double turn.

MARYLAND.

The bar mill at Cleveland is running, with plenty of orders ahead. Ten puddling furnaces are also being operated. There is but little prospect of the rail mill starting up in the near future.

VIRGINIA.

The iron furnace at Ferrol, Augusta county, will be put in operation this week by an Ohio party. The new iron furnace at Lowmoor, in the same county, is going forward in construction, and will be completed as soon as possible and put in operation.—*Winchester News.*

WEST VIRGINIA.

At the annual meeting of the stockholders of the Wheeling Hinge Company the old board were re-elected, as follows: A. G. Robinson, A. W. Campbell, C. D. Hubbard, C. J. Rawling, L. E. Hanson, John McLure, I. H. Williams, John L. Hobbs and O. J. Crawford.

At the annual stockholders' meeting of the Benwood Iron Works, the following board of directors were elected: L. S. Delaplain, A. W. Campbell, J. L. Stifel, Jacob Wise, E. A. Hildreth, G. W. Paxton, J. H. Oglebay, Jacob Berger and Geo. B. Caldwell.

An adjourned meeting of the stockholders of the Belmont Nail Company of Wheeling, was held last Friday, for the purpose of electing a board of directors. No business was transacted, on account of the small representation of stock, and the meeting adjourned, to assemble again at the call of the president.

OHIO.

The Youngstown *News* says: The "iron man" at Brown, Bonnell & Co.'s mill, Thursday, made about 150 pounds of iron from 2000 pounds of pig.

James Ward, proprietor of the Russia Mill at Niles, commenced on last Thursday to manufacture light sheet iron, 24 gauge, 48 inches wide and 7 to 8 feet long. This beats anything in that line yet manufactured west of the Allegheny Mountains.—*Warren Constitution.*

The Ashtabula Rolling Mill has been sold, and will be dismantled.

The Akron *Beacon* says that after February 3d, Aultman, Miller & Co. will commence the unprecedented manufacture of 51 machines a day, as follows: 15 mowers, 15 harvesters, 11 droppers and 10 self-rakes. The warerooms in the brick buildings are already full.

C. Aultman & Co., of Canton, have received orders for 400 Buckeye machines from France. An extra number of workmen will be employed to fill the orders received on account of their representation at the Paris Exposition.

Scioto Furnace is just completing putting in a new hearth, and will be ready to start soon.

The Gaylord Rolling Mill of Portsmouth, is reported to have been sold to John Means, of Ashland, Ky.

Monroe Furnace is tearing down her old hot blast to replace it by one of Blair's patent, and is doing some general repairs.

The Springfield Malleable Iron Works are under contract to furnish all the malleable castings for the Hall Safe and Lock Company, of Cincinnati. They also have a contract to furnish a large lot of car seat castings for the Ohio Falls Car Company.

The *Bulletin* of the Iron and Steel Association states that the Tuscarawas Coal and Iron Company, of Canal Dover, Tuscarawas county, began to demolish their Fairfield Furnace on the 1st of last October, and are now erecting in its place a larger furnace, to be called Dover Furnace. New machinery, boilers, &c., are in course of construction for the new furnace, which it is expected will be prepared to blow in about the 1st of June. It will have an annual capacity of 14,000 gross tons of pig iron. The officers of the company are: J. F. Card, president; James F. Rhodes, treasurer, and S. W. Croxton, secretary and general manager.

MISSOURI.

The forge department and bar mill of Helmbacher's Iron Works at St. Louis are running double turn, and the spike factory single turn.

ILLINOIS.

The new rail mill at Centralia is about ready to start up, and will do so as soon as the minor details are arranged. The prospects for the success of this mill are very flattering.

The Joliet Iron and Steel Works are running steadily, double turn (night and day), and this large and important industrial establishment is said to be in a better and more prosperous condition, under the present efficient management, than ever before. New rolls and other new machinery have been procured for the manufacture of the sixty-foot rails, which will result in a great saving of the waste ends, and give the mills an additional advantage. Since the mills first started, in 1872, a total of 150,000 tons of steel rails have been manufactured, of which amount 32,135 tons have been turned out since the 1st of May last, under the present management. The present production averages 250 tons daily, with a daily consumption of 700 tons of raw material. About 750 men are employed permanently, with a monthly pay roll of $33,000. The entire cost of the mills—building, machinery and repairs—is stated at $2,000,000.

MICHIGAN.

The Peninsular Iron Company, which manufactures cold-blast iron for malleable and car-wheel purposes, use about 2000 bushels of charcoal per day, making about 25 tons of iron.

The St. Gothard Tunnel.

In a paper just communicated to the French Academy, M. Colladon gives some interesting details of the progress of this great enterprise. Numerous difficulties, foreseen only in part, have retarded the work. Besides the excessive hardness of the banks of serpentine and quartz, and the insufficiency of hydraulic force on the Airolo side (after the lowness of water in winter), there has been a very troublesome infiltration in the south portion, the volume of water having increased since the second year to more than 230 liters per second in the advance gallery. The difficulty of working here, under jets that had often the force of those from a fire-engine pump, can be readily imagined. Another difficulty arises from a mass of decomposed felspar mixed with gypsum, found under the plain of Andermatt. This plastic material swells on contact with moist air, and exerts pressure of terrible force, capable of crushing the strongest woodwork and even arches of granite. In some of these parts the workers thought themselves happy when they were able to advance (with manual boring) about 1 meter in three or four days; whereas, through granite, with compressed air and mechanical perforation, a regular advance of 4 meters in 24 hours has been achieved; through gneiss, 6 meters, and more. As regards apparatus, M. Colladon states that the volume of water from the Tremola (Airolo side) having been found insufficient, M. Favre brought water in an aqueduct 3000 meters long, from the Tessin, to work new turbines and four compressors, on the same system as the others, but of greater volume. These turbines are of cast iron. It is notable that the old and smaller bronze turbines (formed of one piece), which have made some 155,000,000 revolutions per annum, are in good preservation, after four or even five years' prodigious service, and still work usefully, after removal of a few millimeters in the circumference, to equalize the exterior part of the cubes. On each side of the tunnel there are at present sixteen air compressors in action, serving both for aëration and for boring operations. They send into the tunnel air under a pressure of eight atmospheres, sufficient to drive eighteen to twenty drills and effect good ventilation of the part already bored, which is at present 6100 meters on the north side and 5390 on the south. On either side there are, night and day, several hundreds of workmen with lamps, and about 300 kilograms of dynamite are consumed. The compressors are found to suffice for good ventilation, rendering unnecessary two large suction vessels, placed two years ago at either mouth of the tunnel for drawing off smoke and vitiated air. The transport of materials is effected by horses in the more advanced part of the tunnel, and by compressed air locomotives in the portions near the mouths. To feed these locomotives eight of M. Colladon's compressors are placed at Airolo and Goeschenen. They draw air from the ventilating pipe, and force it, under a pressure of 12 or 14 atmospheres, into a pipe which passes along the part traversed by the locomotives. A great variety of rock-drills have been used. Each year brings new improvements. The Compagnie du Gothard, which has charge of all the line, with the exception of the tunnel, has suspended work for two years. The excess of its actual over its first estimated expenditure is put at nearly 100 million francs. The works of the tunnel (of which M. Favre is the sole author) have not been interrupted a single day for six years, and its cost, notwithstanding unforeseen difficulties, will exceed the estimates little, if at all. About eight years will suffice to complete the undertaking.

California Pig Iron Market for 1878.

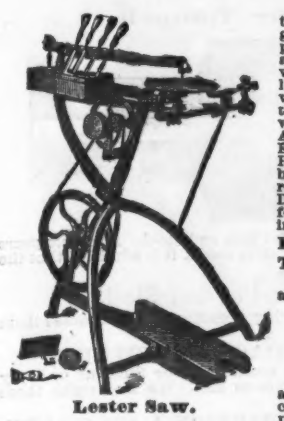
—William Jeffray, metal and coal broker, 204 California street, sends the *Mining and Scientific Press* his review of the year 1878, from which we extract the following: In January Scotch, soft, was quoted at $30 to $31, the highest during the year. The lowest quotations were in October, viz., $25 to $26.50. December quotations were $26 to $27. English and American white show a constant falling off from $28 in January to $25.50 in October, November and December. American soft was $28 to $29 in January; in November, it was $22 to $26; December, $24 to $26. I find the stock of pig iron on hand January 1, 1879, in all 14,370 tons, as per statement given below, being 2,995 tons less than the stock on hand January 1, 1878. Stock of pig iron on hand January 1, 1878, 17,365 tons; importations of 1878, Scotch, soft, 2107 tons; importations of 1878, American, soft, 7235 tons; importations of 1878, American, white,——; importations of 1878, English, white, 1705 tons; total importations of 1878, 11,047 tons; grand total, 28,412 tons. The above figures show a decreased consumption this year as compared with last of 1521 tons, viz., 3312 tons of soft Scotch, and increase of 430 tons of white and 1355 tons of American soft. The importations of 1878 show a decrease of 6425 tons as against the importation of 1877.

The Cleveland (Ohio) Iron Ore Paint Company, No. 10 Carter street, commenced operations last fall, under the auspices of some of the best and most reliable business men, who are manufacturing and shipping large quantities of the best metallic paints in this or any other market, dry, ground in oil, and extra fine red in liquid. These paints are made from carefully selected iron ore, and by means of improved machinery a degree of fineness and covering capacity has been obtained which far exceeds that of any other iron or metallic paint in the market. The objection heretofore existing to the use of iron ore paints among practical painters, has been largely on account of their being too coarse and gritty. By their new process this difficulty has been entirely obviated, and the goods are always uniform and of a fineness (especially in oil and liquids) which cannot fail to commend them. We cheerfully recommend this company and their goods as in all respects worthy the attention and entire confidence of all dealers in paints

Foot Power Bracket Saws

Are now so much in demand that some of them are being sold in almost every town in the United States. Many dealers are doing a profitable Christmas trade on such goods at a time of the year when other business is usually dull. The two Saws shown in these cuts are the ones most in demand. We advertise them as for sale at the hardware stores, and they will be called for. We make a fair discount to the trade.

LESTER SAW.



Lester Saw.

The New LESTER SAW is made of Iron, with all the working parts of Steel, and contains ALL KNOWN IMPROVEMENTS to this date. It is handsomely painted red and green with red stripes, and presents a beautiful appearance. Those parts which are not painted are either Polished or Japanned. We warrant the Saw to be just as herein stated, and we know it will give entire satisfaction, being a more expensive machine than those which we formerly sold for $35. 1st. It consists of a SCROLL SAW, with Tilting Table for Inlaid work; arms 18 inches in the clear; clamps which will hold saws of any length or width, and face them in four different directions, cutting lumber from 1-16th to 1 inch in thickness; speed, 1000 strokes per minute. 2d A CIRCULAR SAW 2¼ inches in diameter, which will cut lumber ¼ inch and less; with an Iron Table 4 by 5 inches. 3d. A DRILLING ATTACHMENT with six Stubs' Steel Drills of various sizes for wood or iron work. 4th. An EMERY WHEEL, with wide and narrow rim. 5th. A TURNING LATHE, with Iron Ways and Rest, Steel Centres and three Best Steel Turning Tools; length of Ways, 15 inches; distance between Centres, 9 inches; swing, 5 inches; length of Slide Rest, 4½ inches; number of revolutions per minute, 7000. Also, with each Machine, six Saw Blades, a Wrench, Screw Driver, Extra Belt and two sheets of Designs, with a nice box for the small tools and a box for the whole machine. It is taken apart when shipped and packed in a box, but the working parts are all left in place and the frame is put together again by a single bolt.

Price for everything above named, - - - - - $8.00

The same without the Lathe and Circular Saw, - - $6.00

When desired, we furnish with the Lathe a very nice Drill Chuck for working metal, and a Tail Stock, with Screw Centre, for $2.00 extra.

ROGERS SAW.

Rogers Saw.

Scroll Sawing and Drilling Attachment. Iron Table, adjustable for Inlaying.

All the working parts of iron and steel; weight, with box, 50 pounds; hight of table above the floor, 32 inches; 12-inch belt wheel; 5-inch balance wheel; arms 18 inches in the clear; latest improved clamps; round belts; extra drills and wrench. The iron and steel parts are polished or Japanned; the wood is painted dark. It is not as good as our Lester Saw, but is much better than any other cheap machine in the market.

Price, including all the attachments and the box, - - $3.00

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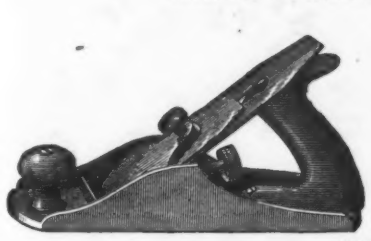
BAILEY WRINGING MACHINE CO.,

No. 99 Chambers Street, New York.



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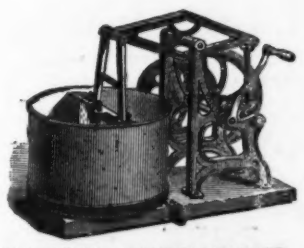

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With Flat, Round, Oval, Depressed, Screw Fancy Heads, etc.

Brass Hooks for Jewelers' Cases, Zinc and Iron Hinges, Turn Buttons, Thumb Springs, Book Clasps, and Fancy Metal Work of all kinds.

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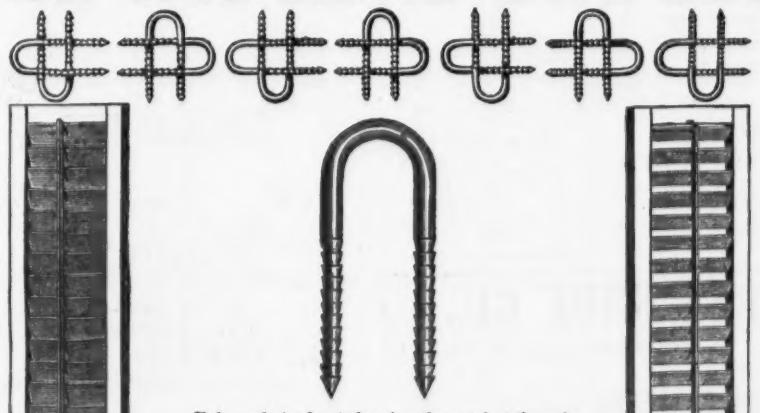
Patent Improved Cone Pointed, Ratchet Thread,

Steel Wire BLIND STAPLES.



Enlarged sized cut showing the ratchet thread.

Will hold double the weight of any other Staple in the market, and drive as well either by hand or machine, and not split the wood.

J. LLOYD HAIGH,

Sole Manufacturer - - 81 John Street, New York.

GRAHAM & HAINES,

P. O. Box 1040. **113 Chambers and 95 Reade Streets, New York.**

HARDWARE MANUFACTURERS' AGENTS, as follows:

Lawrence Curry Comb Co., Curry Combs.
Howard Bros. & Co., Cotton, Wool and Curry Cards.
Thompson, Derby & Co., Scythe Snaths.
Otsego Fork Mills, Steel Forks, Rakes, Hoes, &c.
H. Knickerbacker, Scythes, Axes and Tools.
H. W. Kipp, Nail Hammers.
Kloman, Park & Co., Vises, Picks, Mattocks, Grub Hoes, &c.
Jacobus & Nimick Mfg. Co., Locks, &c.
Sandusky Tool Co., Planes and Plane Irons.
Geo. M. Eddy & Co., Measuring Tapes.
Wheeling Hinge Co., Hinges and Wrought Butts.
Northwestern Horse Nail Co. Horse Nails.
A. G. Coes & Co., Coes' Genuine Screw Wrenches.
F. K. Silby, Emery Cloth.
Holroyd & Co., Stocks & Dies.
Sedgwick Mfg. Co., Butter and Flour Triers, etc.
Ripley Mfg. Co., Mouse Traps.
Silvn'l Loring, Plymouth Tack & Rivet Works.
Carr, Crawley & Devlin, Miscellaneous Hardware & Cast Butts.
J. Mallinson, Cast Steel Shears and Scissors.
Ketchem's Pat. Metallic Sieves.
W. D. Turner & Co., Geneva Hand Fluters.
D. B. Niles & Son, Hand and Sleigh Bells.
C. S. Osborne & Co., Compasses, Calipers, Dividers, &c.
C. W. Maguire, Brushes.
Clark Bros. & Co., Carriage Bolts, &c.
Lowerre & Tucker, the Genuine Knox Fluting Machine.
T. B. Barclay, "Dodge's" Kentucky Cow Bells.
Lane Bros., Swift's and Grocers' Coffee Mills and Measuring Faucets, &c.
T. C. Richards Hardware Co. Bright Wire Goods, Picture Nails, &c.

NATIONAL Horse Nail Co.

MANUFACTURERS OF

FINISHED

[BRIGHT OR BLUED]

These nails are made of the best brands of **NORWAY IRON,** and are guaranteed to be equal to any in the market.

NATIONAL HORSE NAIL CO.,
VERGENNES, VT.

HORACE DURRIE & CO., Agents,
No. 97 Chambers St., New York

PUTNAM'S

HOT FORGED & HAMMER POINTED Horse Shoe Nails.

TRADE MARK.

Made from the best of Norway Iron.

The only *hot forged* machine made Horse Shoe Nail in the world that is *not sheared or cut* on the point. Warranted *never* to *split* or *silver* in the driving, and to hold the shoe *longer* than any other Nail. For sale by the hardware and iron trade generally.

PUTNAM NAIL CO.,

P. O. Address, Neponset, Mass. **BOSTON.**

ANVIL NAIL CO.

We desire to call the attention of the trade to our new manufacture of

Steel Horse Shoe Nails,

made from metal prepared in the Martin-Siemens Furnace by our PATENT process, which produces a nail having all the requisites for a

PERFECT HORSE SHOE NAIL.

The well-known desirable properties of a perfect nail are, that the POINT should be sharp, the SHANK stiff, to drive without crippling under the hammer, SOFT enough to clinch readily, while sufficiently tough to avoid all danger from the "drawing the clinch" or breaking the neck under the head. These properties we claim for the

"ANVIL HORSE NAILS."

In the process of manufacture the metal is compressed under the head, which gives the nail great strength where it is required (between the shoe and hoof), and the cold rolling gives it a stiffness attained in no other way, while the quality of the metal used insures a clinch and point unsurpassed by any nail ever offered in the market.

Samples and prices sent on application.

ANVIL NAIL CO.,

65, 67 and 69 Washington St., New York.

A. F. PIKE.

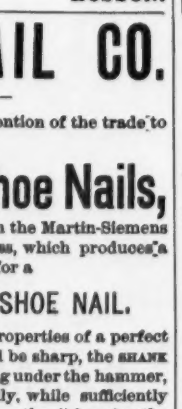
East Haverhill, - New Hampshire,

Manufacturer and Wholesale Dealer in

Scythe, Axe, Knife and Hacker

STONES.

Factories at Haverhill and East Haverhill, N. H., and Evansville and Westmore, Vt.



Genuine OLD RELIABLE,
INDIAN POND (Red Ends),
LETOILE,
LAMOILLE,
DIAMOND GRIT,
UNION,
WHITE MOUNTAIN,
PREMIUM,
GREEN MOUNTAIN,
MOWING MACHINE,
RAGG.

Stones gotten up and labeled in any style desired.

PRICE and QUALITY GUARANTEED.

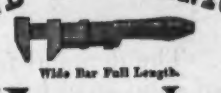
All the above Stones are of good keen grit and *will not glaze.*

Established in 1839. Formerly L. & A. G. Coes.

L. COES & CO.

Manufacturers of L. Coes'

GENUINE IMPROVED AND MECHANICS



Patent Screw Wrenches

UNDER PATENTS DATED

JUNE 26, 1866,
MARCH 23, 1869,
REISSUED 1870.

NOVEMBER 10, 1863,
FEBRUARY 23, 1864,
REISSUED JUNE 1, 1869,
IMPROVED AUG. 1, 1877.

The back thrust when in use borne by the SHANK instead of the Handle.

None genuine unless stamped "L. COES & CO."

WORCESTER, MASS.

Warehouse, 97 Chambers St., & 81 Reade St., N. Y

HORACE DURRIE & CO., Sole Agents.

These Axes Made from

HORACE DURRIE & CO.

Agents, - - - New York.

Firth's Best English Cast Steel.

The 1879 Pennsylvania Lawn Mower.

LIGHT DRAFT AND EASILY ADJUSTED.

Every Machine Warranted to Work as Represented.

Points Claimed as being Meritorious:

1. Lightness, combined with Strength in Construction.
2. Easiness of Adjustment.
3. Easiness in Securing and Adjusting the Handle
4. The Least Liability to Obstruction from Clogging, either in short or (for a Lawn Mower) high Grass.
5. Lightness or Easiness of Running while being worked.
6. The Attractive Appearance of the Machine.

It is the lightest machine in use, and all that is necessary to satisfy our customers of its superiority is to place it in competition with *any other machine* in the town in which they may reside.

PRICE LIST.

Width of Cutter.	Style. Driving Wheels.	Power required.	Weight.	Price.
10 inch.	8 inch.	A Child.	30¾ lbs.	$14.00
12 "	8 "	A Lad.	33½ "	18.00
14 "	8 "	A Lady.	36 "	20.00
16 "	8 "	One Man Size.	38 "	22.00
18 "	8 "	" "	41 "	24.00

NEW MACHINES.

15 inch, 10¼ inch Driving Wheels, 6½ inch Cylinder, Man Size, 48 lbs. $22.00
17 inch, 10¼ inch Driving Wheels, 6½ inch Cylinder, Man Size, 51 lbs. 24.00

GENERAL AGENTS:

LLOYD, SUPPLEE & WALTON, 625 Market Street, Philadelphia.
HORACE DURRIE & CO., 97 Chambers and 81 Reade Streets, N. Y.

The American Machine Co.,

MANUFACTURERS OF

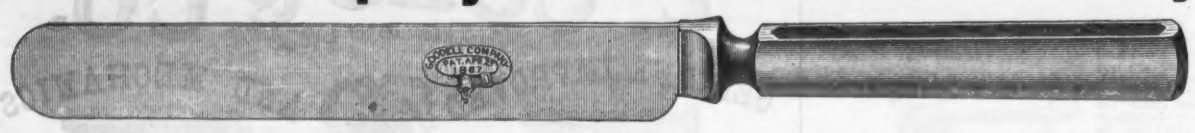
And Other

HARDWARE SPECIALTIES.

OFFICE & FACTORY, 1916 to 1924 N. Fourth St., Philadelphia, Pa.

NEW YORK BRANCH, 198 Chambers Street, - WM. H. BRAMHALL, Manager.

Goodell Company's Plated Table Cutlery.



The demand for a SUBSTANTIAL Table Knife has very naturally made an immense sale of solid steel handled plated goods. The great weight of these Knives and the extremely small size of the handles are serious objections. We are now making a Knife elegant in appearance, with a light and full-sized handle, and fully equal to the solid handle in every other essential particular. They are plated with pure silver in the best possible manner, and prices are "rock bottom" for a genuine article. We are also making several other styles of Plated Cutlery.

Our Common Table Cutlery is unsurpassed in style and finish by any other maker, and is absolutely unapproached and unapproachable in strength, firmness and durability.

Correspondence solicited.

GOODELL COMPANY, Antrim, N. H.

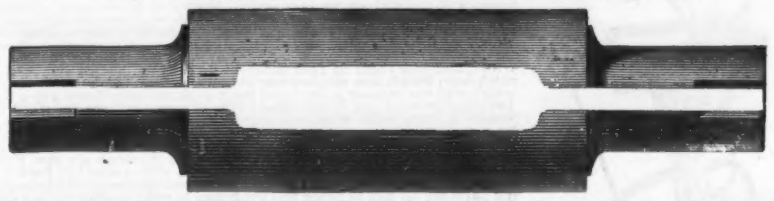
SPECIAL CARD.

Hollow Chilled Rolls.

ONLY MANUFACTURERS.

United States Patents, Nov. 9, 1869; Oct. 9, 1877.

Any Required Diameter or Length.



Suitable for Plate, Sheet, Nail Plate, Bridge Iron and planishing for Iron and Steel. After *two years* of the *severest tests* in *practical use* in *eighty-five* different iron and steel works, it is admitted that the **HOLLOW CHILLED ROLLS** keep their surface and give

A Very Superior Finish to all Products in Iron and Steel.

They will roll 50 to 100 per cent. more Iron or Steel without requiring dressing. We guarantee them in every respect. Only manufacturers of

PATENT GROOVED CHILL ROLLS, CAST TO SHAPE,

for Rounds, Squares, Angles and Shapes. Will roll *twelve times* as much Iron or Steel as ordinary Rolls, without requiring dressing, and make a product of more uniform size. We also make these Rolls for finishing Wrought Iron Pipe.

ROLLING MILL MACHINERY OF EVERY DESCRIPTION A SPECIALTY.

TOTTEN & CO., Pittsburgh, Pa.

HEMACITE.

DIBBLE MFG. CO., Trenton, N. J.,

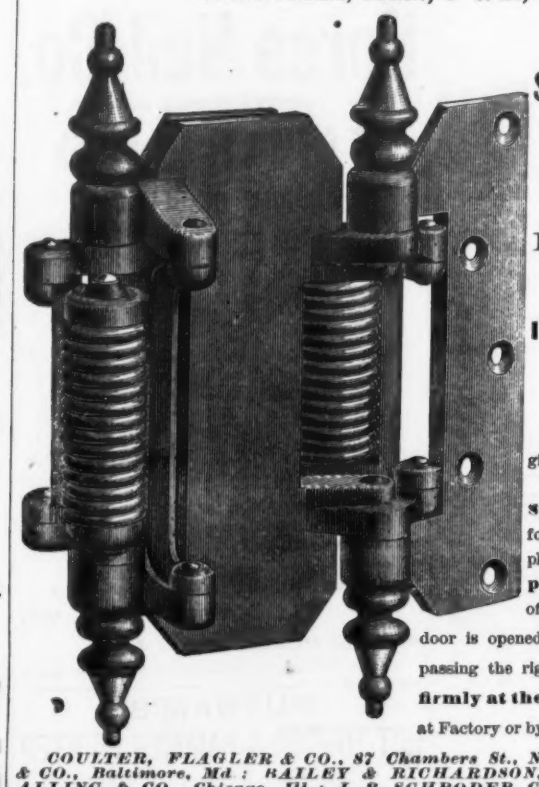
Manufacturers of

Hemacite Door Knobs, Screw Knobs and House Trimmings.

Prices on application.

The Cowles Hardware Co.,

UNIONVILLE, CONN., U S. A., Manufacturers of



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Single and Double Acting

SPRING BUTTS.

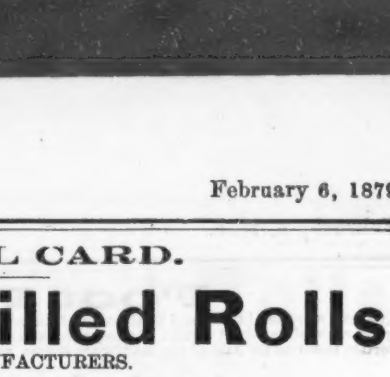
Latest and Best

Investigate before you Purchase.

Large quantities already in use and giving universal satisfaction

Reverse in principle, having **Springs for power** and **Toggles for levers, in combination,** so applied as to exert their **greatest power** when the **door is closed;** offers less resistance the wider the door is opened; **retains the door open** after passing the right angle; **holds the door up firmly at the top. Orders filled promptly** at Factory or by our Agents:

COULTER, FLAGLER & CO., 87 Chambers St., New York; SAM'L G. B. COOK & CO., Baltimore, Md.; BAILEY & RICHARDSON, St. Louis, Mo.; MARKLEY, ALLING & CO., Chicago, Ill.; J. R. SCHRODER, Cincinnati, O.; VAGIN, NEW & CO., Indianapolis, Ind.; DUNHAM, CARRIGAN & CO., San Francisco, Cal.



TRADE MARK.

The Atlantic White Lead and Linseed Oil Co.,

MANUFACTURERS OF

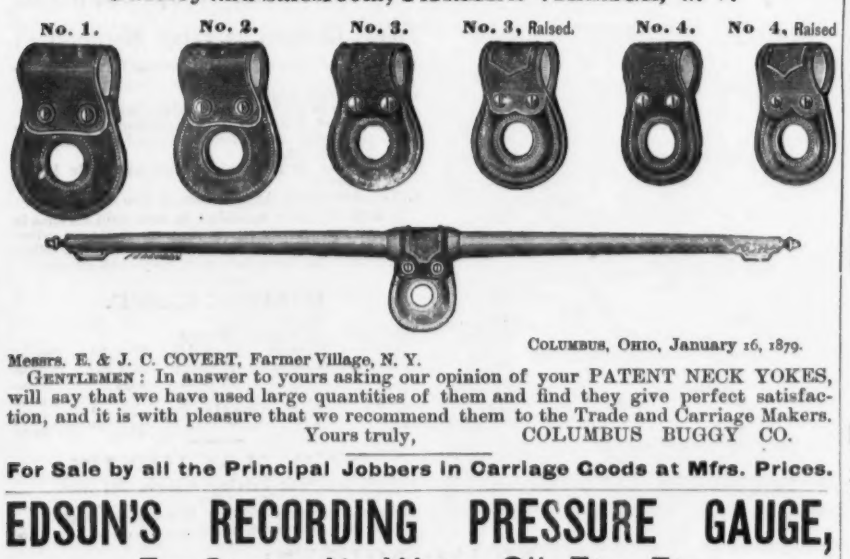
White Lead (Atlantic), Red Lead, Litharge & Linseed Oil.

ROBERT COLGATE & CO.,

287 Pearl Street, New York.

E. & J. C. COVERT, Sole Manufacturers,

Factory and Salesroom, FARMER VILLAGE, N. Y.



COLUMBUS, OHIO, January 16, 1879.

Messrs. E. & J. C. COVERT, Farmer Village, N. Y.

GENTLEMEN: In answer to yours asking our opinion of your PATENT NECK YOKES, will say that we have used large quantities of them and find they give perfect satisfaction, and it is with pleasure that we recommend them to the Trade and Carriage Makers.

Yours truly, COLUMBUS BUGGY CO.

For Sale by all the Principal Jobbers in Carriage Goods at Mfrs. Prices.

SABIN MFG. CO.,

MONTPELIER, VT., Manufacturers of

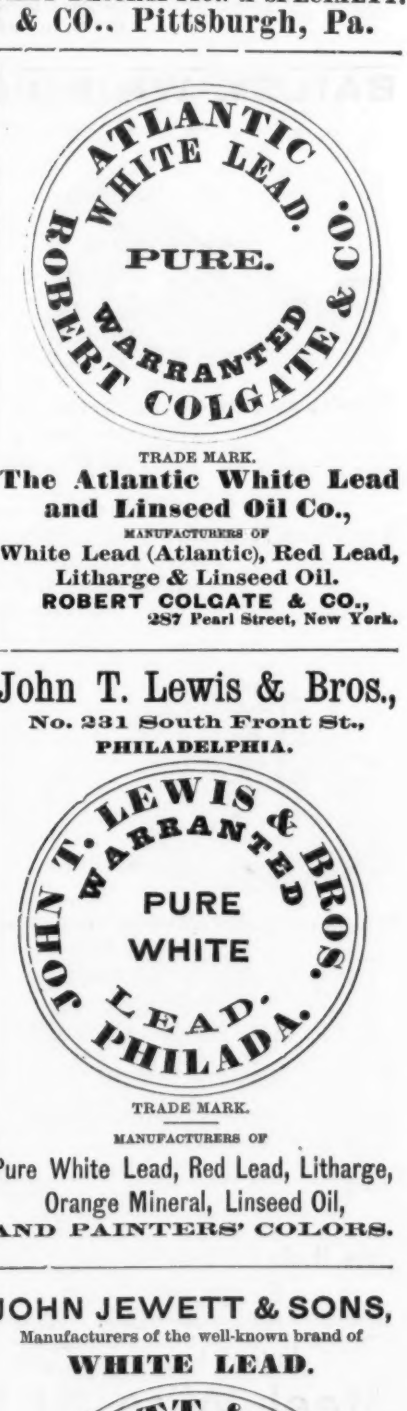
PATENT DOUBLE ACTING SPRING BUTTS,

Sabin's Lever Door Springs

For Heavy Doors.

The BOSS and CROWN SPRINGS for Screen and Light Inside Doors.

General Agents. { HENRY BROOKS & CO., 127 Milk Street, Boston.
E. P. WHIPPLE, 100 Chambers Street, New York.
KELLOGG, JOHNSON & BLISS, 108 Randolph Street, Chicago.



TRADE MARK.

John T. Lewis & Bros.,

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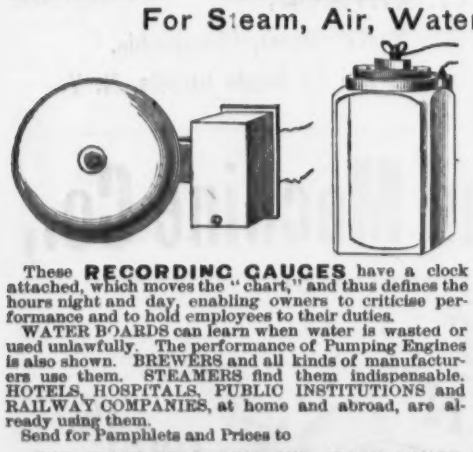
PHILADELPHIA.

EDSON'S RECORDING PRESSURE GAUGE,

For Steam, Air, Water, Oil, Etc., Etc.



Gauge with Gong for Office of Manager.

These **RECORDING GAUGES** have a clock attached, which moves the "chart," and thus defines the hours night and day, enabling owners to criticise performance and to hold employees to their duties.

WATER BOARDS can learn when water is wasted or used unlawfully. The performance of Pumping Engines is also shown. BREWERS and all kinds of manufacturers use them. STEAMERS find them indispensable. HOTELS, HOSPITALS, PUBLIC INSTITUTIONS and RAILWAY COMPANIES, at home and abroad, are already using them.

Send for Pamphlets and Prices to

THE EDSON RECORDING AND ALARM GAUGE CO., No. 91 Liberty Street, New York.

NICHOLS' SELF-ACTING CARBOY PUMP.

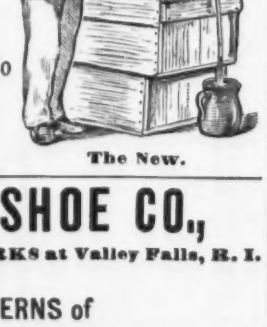
The Old Way.

Indispensable to Brass and Copper Manufacturers, Iron Foundries, Galvanizing Shops, Smelting Works, &c., &c.

For circulars or orders, Address

Acid Pump & Siphon Co

New London, Conn.



The New.

Universally acknowledged to be without an equal as a Kitchen Sink. Send for Descriptive Circular and Prices.

RHODE ISLAND HORSE SHOE CO.,

OFFICE, 81 Canal Street, Providence, R. I. **WORKS at Valley Falls, R. I.**

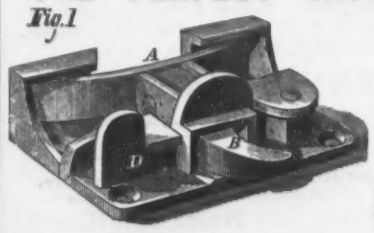
Manufacturers of

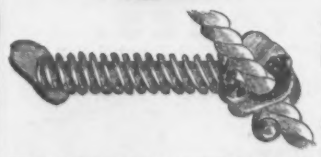
PERKINS and RHODE ISLAND PATTERNS of

HORSE AND MULE SHOES

THE PERFECT SASH TIGHTENER AND LOCK.

Fig. 1





Manufactured entirely from Malleable Iron, Burglar Proof, Anti-Rattling, Draws Sash to Exact Center. No Springs to Get out of Order.

The Best in the Market.

METALLIC CLOTHES PIN,

For either Wire or Rope Line,

Will securely hold any article, from a silk handkerchief to a carpet. No article can be blown away. Does not soil the clothing. Manufactured by

CLARK & SMITH, Patentees, Chester, Orange Co., N. Y.

SOLE AGENTS,

J. I. BROWER & SON,

286 Greenwich St., New York,

Who keep a general assortment on hand for the country trade. **Jowett's Horse Rasps,** 14, 15 and 16 inch, **Maharay's $10 Tire Shrinker, Heller's Rasps.** Send for Circular.

SPECIAL DISCOUNTS TO JOBBERS.

JOHN JEWETT & SONS,

Manufacturers of the well-known brand of

WHITE LEAD.

TRADE MARK.

ALSO MANUFACTURERS OF

LINSEED OIL.

182 Front Street, NEW YORK.

Brooklyn White Lead Co.

TRADE MARK.

White Lead, Red Lead & Litharge.

89 Maiden Lane, NEW YORK.

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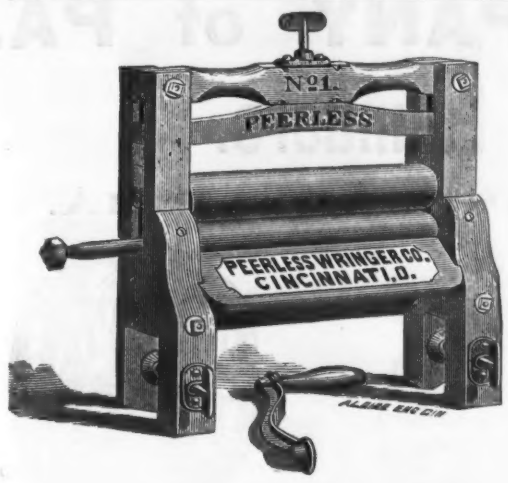
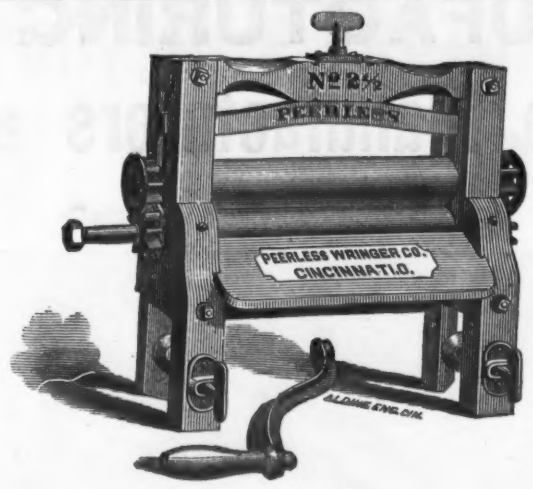
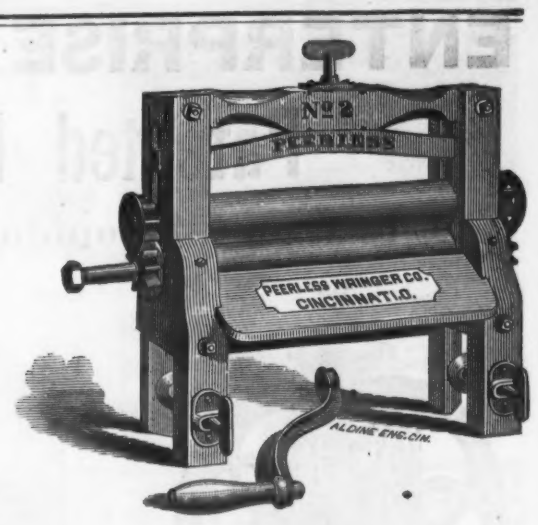






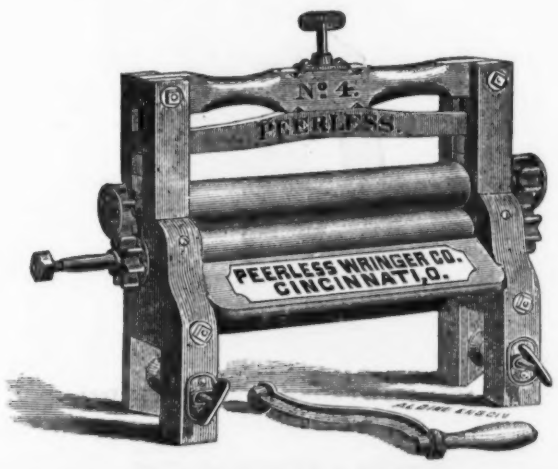
SIMPSON & GAULT.

Peerless Wringer Co.

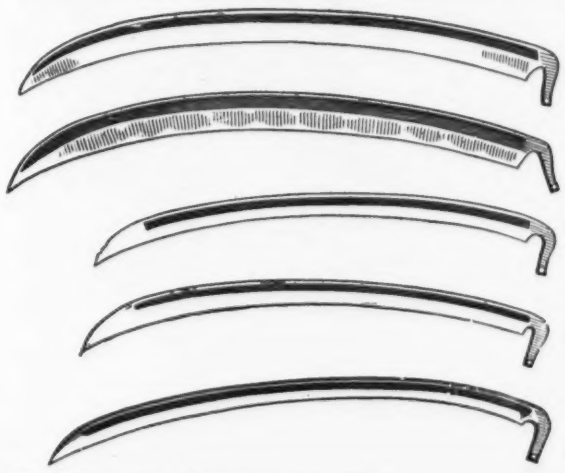
OFFICE AND FACTORY, - Corner Front and John Streets, Cincinnati, O.

NEW YORK OFFICE, 106 Chambers Street.

Sold by the Jobbing Trade throughout the United States.



BEARDSLEY SCYTHE COMPANY, West Winsted, Conn.



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German Steel, Cast Steel and Silver Steel Grass Scythes.

ALSO THE

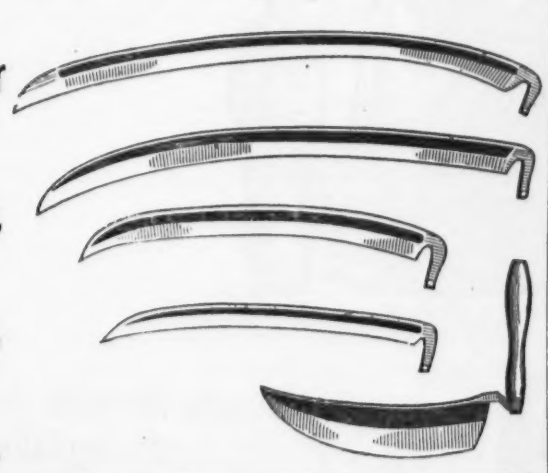
Clipper, Emperor, Beardsley's Golden Trimmer, Conqueror, Dutchman, Waldron, &c

ALSO

Silver Steel, Clipper & Harvest Victor Grain Scythes,
Common Pattern & Spear Point Hay Knives.

ALSO

Corn Knives, Bush & Weed Scythes.



VERONA TOOL WORKS.

VERONA TOOL WORKS.

METCALF, PAUL & CO.,

Pittsburgh, Pa.

BRANCHES. { St. Louis, 720 North Second Street.
{ Chicago, 40 Dearborn Street.

PITTSBURGH, PENN'A.

Iron and Brass Wood Screws.

We manufacture a full line of

IRON AND BRASS SCREWS.

Quality, finish and tests as to strength, guaranteed equal to any in the market.

Hoping to hear from you, and when ready to purchase will quote discounts.

Philadelphia Screw Co.,

Twelfth and Buttonwood Streets.

PHILADELPHIA, December, 1878.

THE DEXTER CARRIAGE SPRING

Combines Strenght, Durability, Beauty.

It is Graceful, Noiseless, Light and Easy.

The DEXTER SPRING is the most perfect Carriage Spring ever invented. Wherever it is known it is rapidly superseding all others for pleasure vehicles. It is especially recommended for use on the rough roads of new countries, as its peculiar construction relieves the strain on the vehicle and shock to the passenger, while the high grade of material used reduces the probability of breakage to a minimum.

For circulars, prices, &c., address

DEXTER SPRING CO., Hulton, near Pittsburgh, Pa., U. S. A.

Philadelphia "STAR" Bolt Works.

NORWAY IRON Carriage & Tire Bolts.

FANCY HEAD BOLTS, Star Axle Clips, &c.

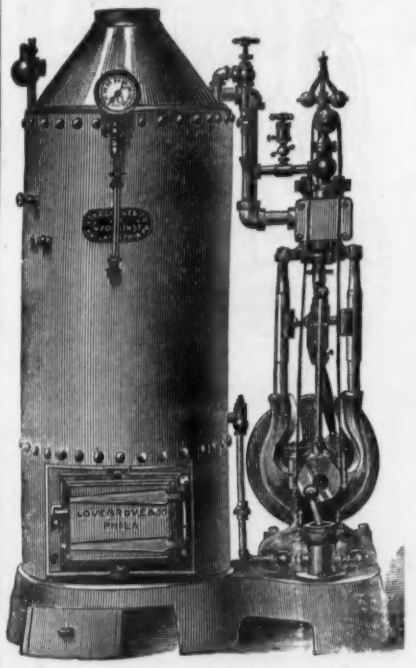
TOWNSEND WILSON & HUBBARD 2301 Cherry St. Philadelphia Pa.

1879.—THE RICHMOND PATENT SINK.—1879.

Manufactured under Letters Patent granted August 1st, 1871, June 19th, 1877, September 17th, 1878.

The patented hinged Strainer and bolted trap are peculiar to this sink. The trap is of simple construction, always in place, and as as a sanitary precaution is invaluable, being an absolute protection against the escape of all poisonous gases. The castings are unsurpassed in smoothness and quality. All sizes are furnished with a galvanized portable soap dish, patented. Galvanized racks for draining dishes furnished when desired. Manufactured by

THE RICHMOND STOVE COMPANY, Norwich, Conn.



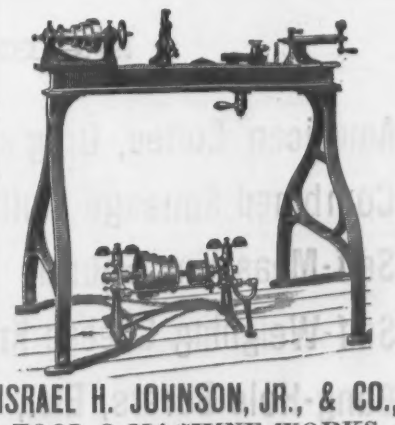
Warranted the Best.

1	H. P. Engine and Boiler	$150
2	" " " "	175
3	" " " "	200

Lovegrove & Co.,

152 North 3d St., Philadelphia.

We manufacture all sizes Engines and Boilers. Write, giving size you want before you purchase. Prices always the lowest.



ISRAEL H. JOHNSON, JR., & CO.,

TOOL & MACHINE WORKS,

Manufacturers of Engine, Brass Finishers', Wood Turners', Amateurs' & Jewelers' LATHES. Slide Rest, Screw Machines, Turret Heads Screw Presses, Screw Clamps, Lathe Carriers, &c.

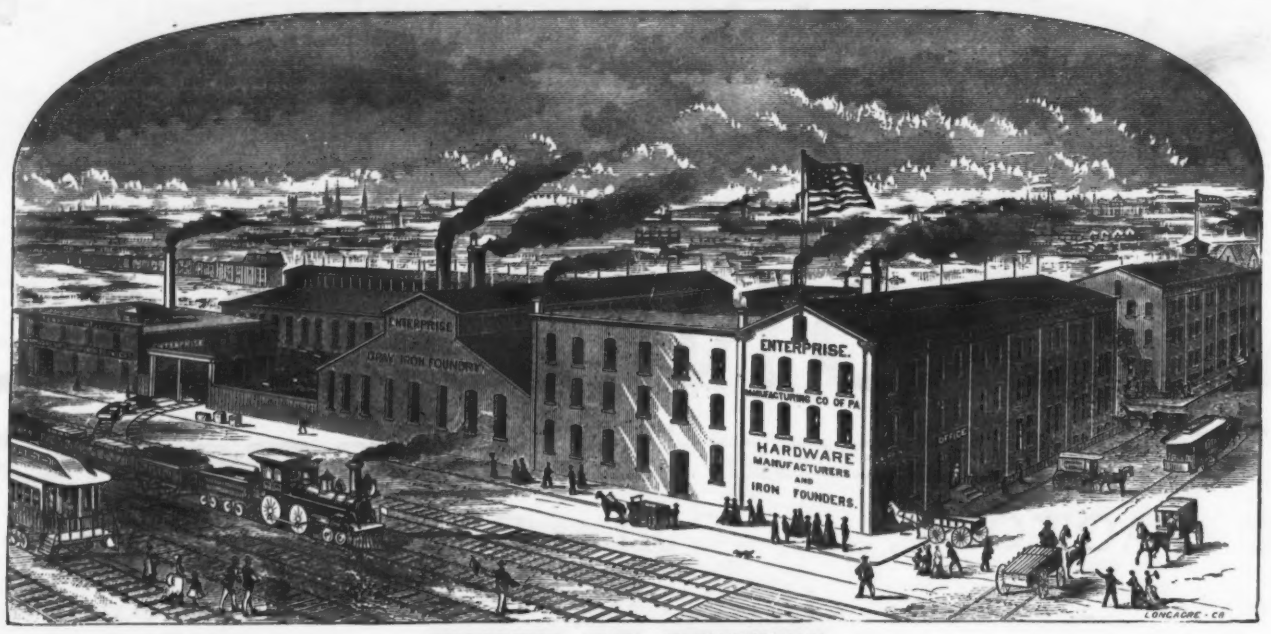
440 N. 12th St., above Noble, Philadelphia, Pa

Israel H. Johnson, Jr.

ENTERPRISE MANUFACTURING COMPANY of PA.

Patented Hardware Manufacturers and Iron Founders.

Third and Dauphin Streets, - - - - PHILADELPHIA.



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Showing Mill Open.

TWENTY SIZES.

Showing Mill Closed.

From $2 to $100 each.

Showing a Full Set of No. 50 or 55 Irons.

ADVANTAGES.

They have a Cold Detachable Walnut Handle.
They are Lined with Non-Conducting Fire Cement.
They Heat Quicker than any other Iron.
They Retain the Heat Longer.
They Require no Holder or Cloth.
They do not Burn the Hand.
They are Double-Pointed.
They Iron both ways.
They are Cheap.

Enterprise Champion Smoked Beef Shaver and Vegetable Slicer.

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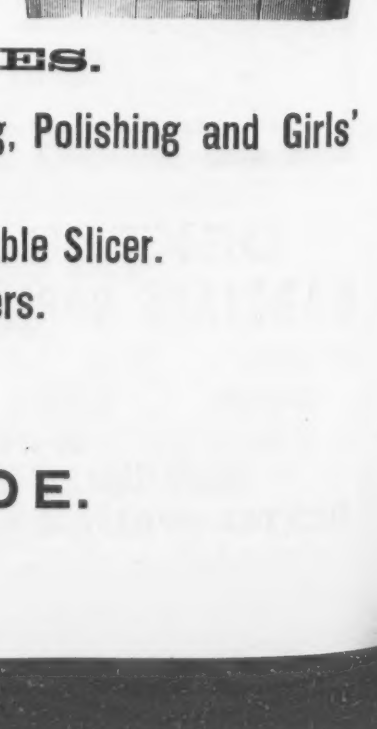

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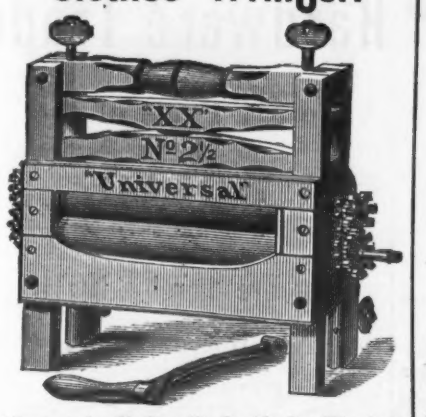

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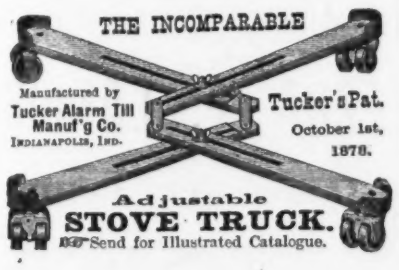

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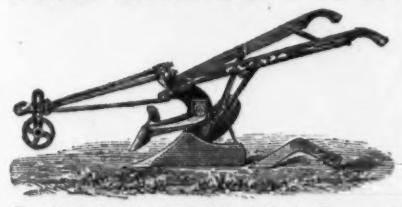

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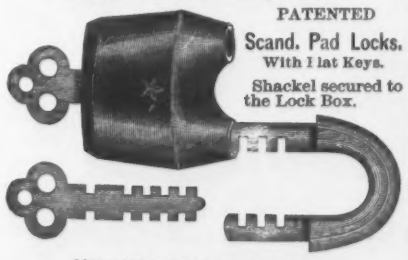

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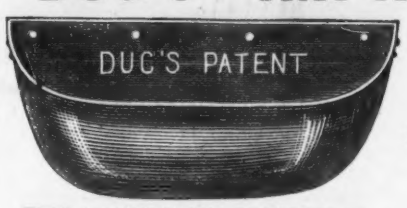

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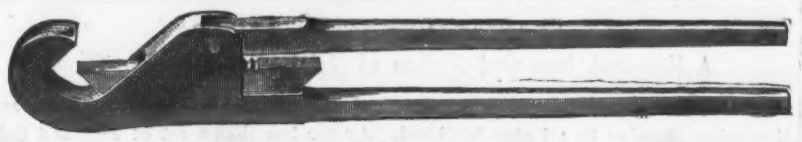

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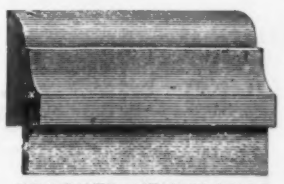

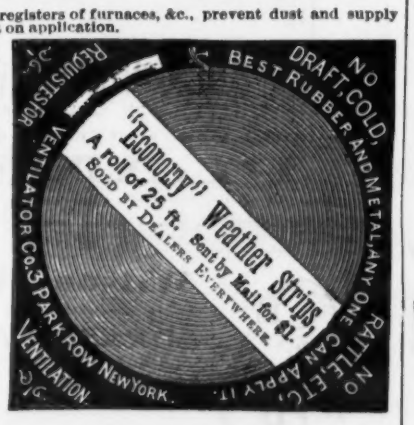

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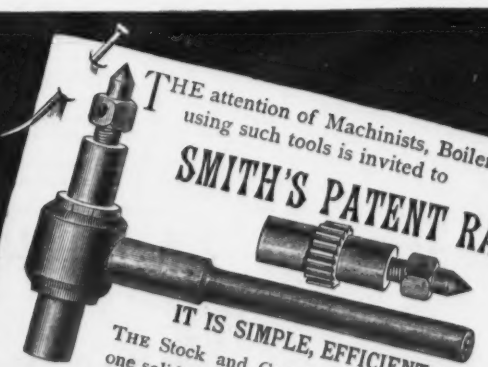

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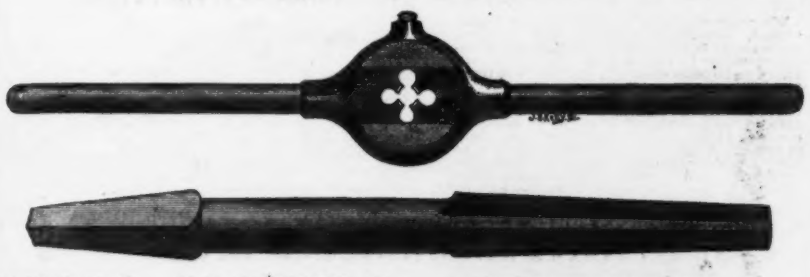

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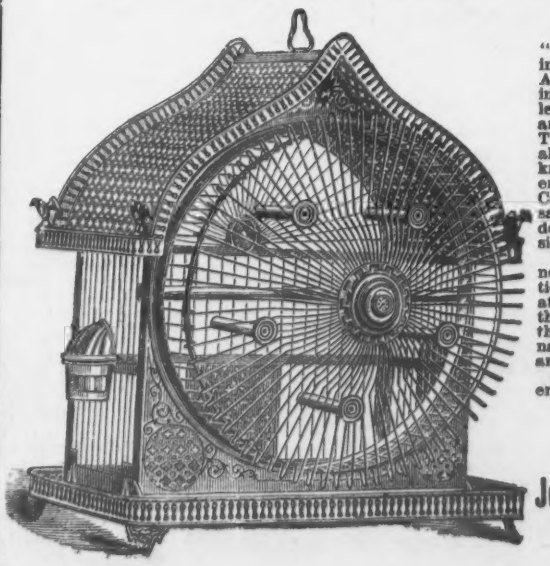

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Hand Bellows....dis 20 %

Belting, Rubber.
N. Y. Belting and Packing Co. Fine Para (Best) to 36 in....dis 30 @ 40 %
N. Y. Belting and Packing Co. Standard to 36 in....dis 50 @ 60 %

Bit Holders.
Extension, Barber's....₩ doz $15.00—dis 40&5 %
" Ives'....₩ doz $15.00—dis 40 %
Diagonal....₩ doz $24.00—dis 40 %
Angular....₩ doz $24.00—dis 40 %
Blind Adjusters.—Domestic....₩ doz $3.00, dis 20 %
Blind Fasteners.—Mackrell's....dis 30 %
Van Sand's....No. 2000
" old pattern....₩ gross, $10.50, dis 20&10 %
Washburn's Patent....₩ gross $14.00, dis 25 @ 30 %
Merriman's....new list net

Blind Staples.
Boardman's Patent, ⅜ in. and larger....₩ ℔ 15c net
" ⅝ in....₩ ℔ 20c dis net

Blocks.—Burr & Co....dis 25 %
Differential Pulley Blocks....dis 20 %
Penfield Block Works, Rope and Iron Strap'd..dis 40 %
" " " Wrot. Iron Com. bushed.dis 30 %
" " " " all steel roll'r.dis 15 %
" " " Sheaves " " dis 30 %
Stanley R. & L. Co., Rope and Iron Strap'd. dis 35&10 %

Bolts.
Cast Iron Barrel, Shutter, &c....dis 65&10 %
Cast Iron Chain (Sargent's list)....dis 65&10 %
Bush's Lever and Chain Bolts....dis 40, 10&10 %
Wrought Iron Barrel....dis 60&10 %
" " Square....dis 60&10 %
" " Shutter (Stanley's list)....dis 50 %
" " " (Sargent's list)....dis 50, 10&10 %
" " Sunk Flush, Sargent's....dis 50&10&10 %
" " " " Stanley's....dis 25&10 %
" " B.K.Flush, Com'n, Stanley's..dis 50&7½ %
" " " " Ex. Heavy, " dis 40&10 %
" " Plated Knob & Slide Flush " dis 50&10 %
Carriage and Tire, Common....dis 75&3 % cash
" " Norway Iron....dis 70 %
" " R. B. & W....(old list) dis 70&5 %
" " Philadelphia....dis 70 %
" Coleman....dis 60&10 @ 60&20 %
" Shelton's....(old list) dis 70&5 %
Tire, Am. Screw Co.'s, Phila....dis 70&5 @ 70&10 %
" "Bay State"....dis 75&10 @ 80 %
Star (Phila)....dis 60&10@60&20 %
Stove—American Screw Co.'s....dis 55&5 @ 60 %
" R. B. & W....dis 50&10&5 %
Plow....dis 50&10 %
Machine....dis 70&5 %
Bolt Ends....dis 60 %
Borax....10@11c ₩ ℔ net

Boring Machines.	Upright.	Angular.	
First quality, no Augers	$5.50	$7.50	dis 40&10 %
" with Augers	9.00	11.00	dis 40&10 %
Second quality, no Augers	2.35	4.00	net
" with Augers	4.00	4.65	net
Snell's, no Augers	4.75	6.25	dis 40 %
Phillips' with Augers	....	9.00	dis 3[illegible]

Bow Pins.
Hotchkiss'....low list dis 10 %
Humason, Beckley & Co.'s....dis 60 %
Sargent & Co's....$19.70 and $21.40, dis 60&10 %
Braces.—Barber's Patent....dis 40&5 %
O. S. Backus....dis 50&10 %
Wilson Mfg. Co....dis 10 %
Spofford's Patent....dis 50&5 %
Noble Patent....dis 40&5 %
Ives' "Centennial"....dis 50 %
Common Ball (American)....dis 35 @ 40 %
Brackets.—Shelf (Sargent's)..dis 60&10 @ 60&10&10 %
Swing (T. & S. Mfg. Co.)....dis 33⅓ %
Bright Wire Goods....dis 70&10 %
Bull Rings.—Union Nut Co....dis 50&20 %
Sargent's....dis 66⅔&10 %
Hotchkiss'....low list dis 10 %
Humason Beckley & Co.'s....dis 60 %

Butts.
Wrought Brass....dis 60 %
Cast Brass, Tiebout's....dis 40 %
" Corbin's....dis 50&10 %
COMMON CAST, NOT DRILLED.
Fast Joint, Narrow....dis 60&10 %
" Broad....dis 65&10 %
Loose Joint, Narrow and Broad....dis 70&10 %
Parliament Butts....dis
Mayer's Hinges....dis
DRILLED AND WIRED.
Fast Joint, Narrow....dis 55&10 %
" Broad....dis 60&10 %
" Broad, Japanned....dis
Loose Joint / Japanned / with Acorns....dis 70&10 %
Parliament Butts....dis 62½&10 %
Mayer's Hinges....dis 72½&10 %
Loose Pin no Acorn....dis 75&10 %
" Acorns....dis 70&10 %
" " Japanned....dis 75&10 %
" " Plated Tips....dis 70&10 %

Union Mfg. Co.'s Fancy Butts—
Figured Enameled Loose Joint....dis 65&10 %
Boston Finish, Plain....dis 80&10 %
" " with Iron Acorns....dis 75&10 %
" " with Silvered Acorns....dis 70&10 %
WROUGHT IRON.
Fast Joint Narrow....dis 50 %
" Lt. Narrow....dis 45 %
" Broad....dis 50 %
Loose Joint, Broad....dis 50 %
Table Butts, Back Flaps, &c....dis 45 %
Inside Blind, Regular....dis 50 %
" Light....dis 40 %
Loose Pin, Wrt....dis 55 %
Spring Hinges:
American Spiral Spring Butt Co., Jap'd....dis 25 %
" " " " Fancy....dis 10 %
Geer's Single and Double Acting....dis 25 %
Sabin Mfg. Co.'s Double Acting....dis 35 %
Centennial, Japanned....dis 25 %
" Ornamental....dis 20 %
Union Spring Hinge Co.'s....dis 25 %
American Spring Hinge Co.'s....dis 25 %
Union Mfg. Co....dis 25 %
Bommer's....dis 25 %
Blind Butts, Parker....dis 75&10 %
" Palmer....dis 40&5&10 %
" Seymour....dis 65&10&10 %
" Shepard....dis 70&10 %
" Lull & Porter....dis 66⅔&10 %
" Nicholson....dis 45&10 %
" Huffer....dis 40&10 %
" Clark's, Nos. 1, 3, 5, 40 and 45....dis 75&10 %
" Buffalo "Noiseless"....dis 75&10 %
" Sargent's....dis 70&10&10 %

Butchers' Cleavers.
Humason & Beckley Mfg. Co....dis 20 %
D. R. Barton Tool Co....dis 20 %
Bradley's....dis 25 %
Beatty's....dis 25 %

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

Hart Mfg. Co....dis 50&10 %

0	1	2	3	4	5	6
$20.00	26.00	29.50	33.00	37.00	41.50	45.00

Can Openers.
Messenger's Comet....₩ doz $3.00, dis 20 %
American....₩ doz $2.25, dis 65&10 %
Lyman's....₩ doz $3.75, dis 20 %
Poole....₩ doz $3.75, dis 40 %
No. 4, French....₩ doz $2.25, dis 55 %
No. 5, Iron Handle....₩ doz $0.75 net
Eureka....₩ doz $2.50, dis 10 %
Sardine Scissors....₩ doz $7.00, dis 55 %
Star....₩ doz $5.00, dis 25 %

Caps—Percussion, ₩ 1000.
Hicks & Goldmark's G. D. & S. R....35c
" " E. B. 1-10 Ground....70c, dis 5 %
" " E. B. 1-10 Turned....65c, dis 5 %
" " D. W. P. 1-10....$1.40, dis 5 %
" " D. W. P. ¼....1.35, dis 5 %
" " Colt's 1-10....70c, dis 5 %
F. L....50c, dis 6 %
Ely's E. B....1-10s, 65 @ 68c
" Double Waterproof, ...1-4s, $1.50; 1-16s, $1.58c
Colt's....1-10s, 80c
Cartridges.—Metallic....dis 60&7 %
Cards.—Horse and Curry....dis 33⅓&10 %
Cotton....dis 25&10 %
Wool....dis 25&10 %
Car Pusher.—"Giant"....$6.25 each, dis 20 %

Carpet Stretchers.
Cast Steel, Polished....₩ doz $5.00, dis 30 %
" Iron Steel Points....₩ doz $2.00, dis 45&5 %

Casters.
Bed....dis 55 %
Plate and Shallow Socket....dis 55 %
Deep Socket....dis 40 %

Cattle Leaders.
Hotchkiss' Sons'....dis 10&10 %
Humason, Beckley & Co.'s....dis 60 %
Sargent's....dis 60&10&10 %

Chain.
Trace, 6½-1-2....by the cask, ₩ pair 45 @ 46c
" 6½-10-3....by the cask, ₩ pair 43 @ 44c
" 7-10-2....by the cask, ₩ pair 40 @ 50c
German Halter Chain....dis 40 @ 40&10 %
" Coil....dis 40 @ 40&10 %
Galvanized Pump Chain....₩ ℔ 10½c dis 10 %
Jack Chain, Iron....dis 60&10 %
" Brass....dis 55&10 %

Chalk.
White....₩ gross 55c net
Red....₩ gross 75c net
Blue....₩ gross 00c net
White Crayons....₩ gross 14½c net

Chisels.
D. R. Barton Tool Co. (all kinds)....dis 20 %
Socket Framing, Crossman....dis 70 %
" " Buck Bros....new list. dis 25 %
" " Merrill....dis 70 %
" " Witherby Tool Co....dis 70 %
" " Douglass'....dis 70 %
" Firmers, Crossman....dis 65&10 %
" " Buck Bros....new list. dis 25 %
" " Merrill....dis 70 %
" " Witherby Tool Co....dis 70 %
" " Douglass'....dis 70&5 %
" Corner....dis 65@70 %
Tanged Firmers extra....dis 40 %
" Butcher's....$5.00 @ $5.25 to £
" Spear & Jackson's....5.00 to £
" Buck Bros (Shank)....5.00 to £

Clamps.
Iron, Providence Tool Co.'s, Wrt. Iron....dis 25 %
" Adjustable, Gray's....dis 20 %
" " Lambert's....dis 20 %
" " Snow's....dis 40&5 %
" " Hammer's....dis 15 %
" " Stearns'....dis 15&10 %
" Cabinet, Sargent's....dis 60&10 %
" Carriage Makers', Sargent's....dis 60&10&10 %
" Cord and Tape (T. & S. Mfg. Co.)....dis 30 %

Clips, Axle.
Norway or Best....dis 60
Superior....dis 60&10 %
Cockeyes....1¼ in., 28c.; 1⅜ inch, 33c.; 1½ in., 37c, net

Cocks, Brass.
Racking, new list....dis 50 %
Globe, " ....dis 50 %
Plain Bibbs, " ....dis 50 %
Ale and Beer, new list....dis 50 %

Coffee Mills.
Board and Box....dis 20@25 %
Increase Wilson's....net
Selsor's Pat....$9.50, $10.50, dis 25 %
American (Enterprise Mfg. Co.)....dis 20 %
French Steel....dis 20 %
The Swift (Lane Bros.)....dis 25 %

Combined Dinner Pail and Lantern.
₩ doz $15.00....dis 30 %

Compasses, Dividers, &c.
Compasses....dis 45 %
Callipers....dis 45&10 %
Dividers....dis 55 %
Bemis & Call Co.'s Dividers....dis 60&20 %
" " Compasses & Callipers....dis 55 %
" " Wing & Inside or Outside.dis 50&5 %
" " Double....dis 60 %
" " Call's Pat. Inside....dis 35&10 %
Cook's....dis 15 %
Excelsior....dis 50 %
Miller's Patent....dis 25 %

Coopers' Tools.
Bradley's....dis 15 @ 20 %
D. R. Barton Tool Co....dis 20 %
Corkscrews.—Humason & B....dis 33⅓ %
Corn Knives and Cutters.—Bradley's....dis 10 %

Crow Bars.
Cast Steel....₩ ℔ 9c net
Iron, Steel Points....₩ ℔ 5c
Crucibles.—Gautier & Co....₩ No. 5½c

Curling Irons, &c.
⅜, ⅝, ¾ in., $1.80, 2.00, 2.40....dis 10 %
Curling Tongs....₩ doz $3.65, dis 10 %
Pinching Irons....₩ doz 7.50, dis 20 %

Curry Combs.
Fitch's (List of No. 240, $1)....dis 45 %
Hotchkiss' & Kellogg's, Iron & Brass, old list.dis 4[illegible]&7½ %
Hotchkiss' Novelty....dis 20&10 %
Rubber....₩ doz $9.00, dis 20&10 %
Curtain Pins.—Silvered Glass....dis 15 %
White Enamel....dis 15 %

Cutlery.
Meriden Cutlery Co. (Table)....net
Am. Miller Bro.'s Cutlery Co....dis 25 %
Humason & Beckley, Pocket....dis 25 %
Naugatuck Cutlery Co....list net

Dog Collars.
Embossed Gilt....dis 20 %
Leather....dis 30 %
Brass....dis 25 %

Door Springs.
Torrey's Rod....₩ doz $1.75 net
Gray's " ....₩ doz $1.65, net
Gem (Coil)—
No. 1, Large, Japanned....₩ doz $3.50 }
No. 2, Medium, " ....₩ doz 2.50 } dis 10 %
No. 3, Small, " ....₩ doz 2.00 }

Challenge (Coil)— Nos.		9	7	6	
Japanned	₩ doz	$2.00	2.50	3.50	dis 30 %
Coppered	₩ doz	4.00	4.50	5.00	
Galvanized	₩ doz	3.50	4.00	4.50	
Nickeled	₩ doz	5.50	6.00	7.00	
Premium (Coil)— Nos.		1	2	3	
Japanned	₩ doz	$7.50	6.25	5.00	dis 30 %
Nickeled	₩ doz	11.00	9.50	8.00	

Star (Coil)—For Cop'd, Nickel-Plated, &c., see list.
No. 4, ("Shoo Fly") Screen door size ₩ doz $1.80 }
No. 5, Screen Door Size....₩ doz $2.00 } dis 30 %
No. 6, Medium....₩ doz 2.50 }
No. 7, Large....₩ doz 3.50 }
Sabin's Lever..No. 1, $1; 2, $1.50; 3, $2; 4, $2.50; dis 30 %
Sabin's Boss....₩ doz $4.20, dis 40&10 %
Philadelphia....5 in., $5.00; 8 in., $7.00, dis 35 %
Barker's Concealed....dis 20 %
Cowell's....No. 1, $18.00; No. 2, $15.00 ₩ doz, dis 50 %
Rubber, complete....₩ doz $1.90, net

Drawing Knives.
Crossman's No. 1....dis 70 %
D. R. Barton Tool Co....dis 20 %
Merrill....dis 70 %
Nobles Mfg. Co....dis 15 %
Bradley's....dis 35 %
Adjustable Handle....dis 20 %
Witherby Tool Co....dis 70 %
Douglass....dis 70 %

Drills and Drill Stocks.
Blacksmiths'....each $1.85 net
Blacksmiths' Self Feeding....each $7.50, dis 10 %
Breast, P. S. & W....dis 25 %
" Hotchkiss....dis 25 %
Breast, Wilson's....dis 20 %
" Miller's Falls....each $2.50, dis 25 %
Ratchet, Merrill's....dis 25 %
" Ingersoll's (old list)....dis 35 %
" Whitney's....dis 30 %
" Weston's....dis 20 %
" Moore's Triple Action....dis 20 @ 25 %
Whitney's Hand Drill....dis 20&10 %
Wilson's Drill Stocks....dis 10 %
Automatic Boring Tools....each $2.75, dis 30 %
Drill Chucks.—Morse's Beach Patent....dis 30 %
" Adjust..each $10.00, dis 20 %
Danbury....$8.00, dis 30 %

Egg Beaters.
Dover....₩ doz $5.00, dis 20 %
Family....₩ doz $3.00 net
National....₩ doz $4.50, dis 33⅓ %

Elevator Buckets.
Mill E. Buckets, light, 3½ to 10 in., (Duc's Improved) ₩ 100 $15.00 @ $54.00, net
Mill E. Buckets, heavy, 5 to 10 inches (Duc's Improved) ₩ doz $5.60 @ $10.20, net
Storehouse, (Duc's Patent) 12 to 17, $12.00 @ $20.00...net

Emery and Emery Paper.
Genuine Chester—Regular Nos....₩ ℔ 6c
" " Flour and FF....₩ ℔ 5c
" " in 10-lb. cans....2c extra
Washington Mills—Regular Nos....₩ ℔ 8c
" Flour....₩ ℔ 5c
Wellington Mills, Grain....₩ ℔ 10c net
" Flour....₩ ℔ 8c net
Hampden Emery Grain....5c net
" " Flour....3c net
B. & A. Emery Paper....dis 20 %

Enameled and Tinned Ware.
Kettles....dis 45 %
Sauce Pans....dis 35 %
Tinned Sauce Pans....dis 35 %

Escutcheon Pins.
Iron....dis 33⅓ %
Brass....dis 40 %

Escutcheons.
Door Lock....Same discounts as Door Locks
Brass Thread....dis 60&10 %
Wood....dis 25 %

Faucets.
Fenn's....dis 50 %
Fenn's Cork Stops....dis 40 %
Star....dis 55&10 %
Frary's Patent Petroleum....dis 20&10 %
Wood and Metallic....dis 40 %
West's Patent Key....dis 40 %
Metallic Key, Leather Lined....dis 30&10 %
Cork Lined....dis 70&10 %
Enterprise (Self Measuring)....₩ doz, $36.00, dis 20 %
Felloe Plates....₩ ℔ 15c, dis 50 %

Files.
American File Co....$5.00 to £. dis 35 %
Auburn....$5.00 to £. dis 35 %
Arcade....$5.00 to £. dis 35 %
G. & H. Barnett....dis 25 %
Nicholson....(Nicholson List) dis 35 %
Heller & Bros....$5.00 to £ dis 25 %
Madden & Cockayne File Co....$5.00 to £, dis 25 %
Jowitt's....$4.50 to £
J. & Riley Carr....4.50 to £
Stubs'....$7.00 @ 7.50 to £
Butcher's....4.50 to £
Walter Spencer & Co.'s "Diamond"....4.50 to £
Fisher's....4.50 to £
Moss & Gamble....4.75 to £
H. Disston & Sons (new list)....dis 35 %
Limet & Co. (French)....$4.25 to £

Fluting Machines.
Knox, 4-inch Rolls....$2.50 each net
" 6 " " ....3.00 each net
" 8 " " ....5.00 each net
Peerless, 4-inch Rolls....4.00 each net
" 5 " " ....4.75 each net
Eagle, 3½-inch Roll....$1.62½ each net
" 5½ " " ....$2.12½ each net
Eureka, No. 1, 7-inch Roll....6.50 each, dis 33⅓ %
" No. 2, 6-inch Roll....5.50 each, dis 33⅓ %
Crown....4½-in., $2.62½; 6-in., $3.00; 8-in., $5.00 each net
Star....4½ in., $3.50; 6 in., $4.00 each net
Crown Jewel....6 in., $2.50 each net
Domestic Fluter....1.50 each net
Geneva Hand Fluter....
Shepard Hand Fluter....No. 75 ₩ doz $15, dis 10 %
" " ....No. 104, ₩ doz $12.00 net
Combined Fluter and Sad Iron....₩ doz 15.00, dis 30 %
Buffalo....₩ doz 10.00, dis 10 %
Fluting Scissors....dis 45&10 %

Forks.
Hay, Manure and Spading....new list, dis 15 %
Plated "A 1, Rogers & Bro....dis 40&5 % cash
" Reed & Barton....dis 40&5 %

Fruit and Jelly Presses.
Enterprise Mfg. Co....dis 20 %

Fry Pans.
Burnished, list as follows....dis 60&5 %

No.	0	1	2	3	4	5	6	7	8
₩ doz	$2.00	$3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00

Acme Patent, same list as above....dis 45 %

Gauges.
Marking, Stanley's....dis 50&10 %
" Chapin's....dis 50&10 %
" Star....dis 35 %
Wire....dis 10 %
" Smith's Patent....₩ doz $18.00, dis 40 %

Gimlets.
Nail and Spike....dis 50 %
"Bee" Gimlets....₩ gross $12.00, dis 45 %
"Eureka" Gimlets....dis 50 %
"Diamond" Gimlets....dis 20&10 %
Double Cut, Shepardson's....dis 40 %
" " Hartwell's....dis 50 %
" " Ives'....dis 55 %
" " Douglass'....dis 40 %

Glue Pots.
Tinned and Enameled....dis 45 %
Family, Howe's "Eureka"....dis 30 %
" L. F. & C.'s "Handy"....dis 40 %

Grindstone Fixtures.
Sargent's Patent....dis 70&10&10 %
Reading Hardware Co....dis 40&10&2 %
" " "Keystone"....dis 45&10&2 %

Hammers.
Maydole's, New List of Dec. 10th, 1878....dis 15 %
Cheney's, List January, '79....dis 20 %
H. Hammonds....dis 20 %
Verree....dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 and 1.75.dis 25&10 %
Warner & Noble's....dis 10 %
Kip's (new list, Dec. '78)....dis 25 %

Hand Cuffs and Leg Irons.
Providence Tool Co.'s Hand Cuffs, $15.00 ₩ doz } dis 10 %
" " Leg Irons, $25 ₩ doz }
Tower's....dis 25 %

Handles.—Door or Thumb Latches—

Nos.	0	1	2	3	4	
Per doz	$0.80	1.00	1.18	1.35	1.60	dis 70 %

Roggin's Latches....per doz 30 @ 33c net
Bronzed Iron Drop Latches....₩ doz 70 @ 85c net
Jap'd Store Door Handles—Nuts, $1.40; Plate $0.95
no Plate, 75c....net
Barn Door....per doz $5.00, dis 65&10&10 %
Wrought Chest....dis 60&5&10 %
Surface Chest, Sargent's list....dis 6⅔&10 %
Flush Chest....dis 60&10&10 %
Lifting....dis 60&10 %
Saw and Plane....dis 40&10 %
Hammer and Hatchet....dis 20 %
Brad Awl....₩ gross $2.00, dis 25&10 %
Hickory Firmer Chisel, assorted, ₩ gross $4.50
" " " large, " 5.00
Apple " " assorted, " 5.00
" " " large, " 6.00
Socket " " assorted, " 3.00 } dis 25&10 %
" Framing " assorted, " 5.00
File, assorted, ₩ gross....2.75
Auger, assorted, ₩ gross....0.00
" large....7.00
Patent Auger, Ives'....₩ set $1.25, dis 10 %
" Douglass'....₩ set $1, dis 20&10 %
" Swan's....

Hangers.
Barn Door....dis 70&10 @ 75&10 %
Novelty....dis 40 %
Challenge....dis 50 %
Climax (Anti-Friction)....dis 50&10 %
Sterling Improved (Anti-Friction)....dis 75&10 %
Cheritree....dis 20 %

Harness Snaps.
Henshaw's....List of 1½ changed to $14.00, dis 55 %
Judd's.... " " 14.00, dis 55 %
Fitch's (Bristol) " 14.00, dis 55 %
Hotchkiss'....dis 10 %
Andrews'....dis 50 %
Sargent's....dis 60&10 %
New York Wire....dis 20&20 %
"German"....dis 70 %

Hatchets.

	Nos.					
Isaiah Blood			dis 30 %			
Shingling,	1 2 3	₩ doz	$7.25	$8.00	$8.75	
Claw,	1 2 3	₩ doz	7.75	8.50	9.25	
Lathing,	1 2 3	₩ doz	7.50	8.00	8.50	
Hunt's			dis 25 @ 30 %			
Shingling,	1 2 3	₩ doz	$7.25	$8.00	$8.75	
Claw,	1 2 3	₩ doz	7.75	8.50	9.25	
Lathing,	1 2 3	₩ doz	7.50	8.25	9.00	
Hurd's			dis 45 %			
Shingling,	1 2 3	₩ doz	$8.00	$8.50	$9.00	
Claw,	1 2 3	₩ doz	9.00	9.50	10.00	
Lathing,	1 2 3	₩ doz	8.00	8.50	9.00	
Simmon's			dis 35 %			
Shingling,	0 1 2 3	₩ doz	$7.50	$8.00	$8.50	$9.00
Claw,	1 2 3	₩ doz		9.00	9.50	10.00
Lathing,	1 2 3	₩ doz		8.00	8.50	9.00
Broad,	1 2 3 4	₩ doz	9.00	10.00	12.00	14.00
"	5 6 7 8	₩ doz	16.00	18.00	20.00	22.00
Collins			dis 10 %			
Shingling,	1 2 3	₩ doz	$6.00	$6.50	$7.00	
Claw	1 2 3	₩ doz	6.50	7.00	7.50	
Lathing,	1 2 3	₩ doz	6.00	6.50	7.00	
D. R. Barton Tool Co. (Solid Steel)			dis 20 %			
Shingling,	1 2 3	₩ doz	$11.00	$10.50	$10.00	
Lath,	1 2 3	₩ doz	10.50	10.00	9.50	
Half Hatchets,	1 2 3	₩ doz	11.00	10.50	10.00	
D. R. Barton Tool Co.			dis 35 %			
Shingling,	1 2 3	₩ doz	$8.50	$8.00	$7.50	
Claw,	1 2 3	₩ doz	9.50	9.00	8.50	
Half,	1 2 3	₩ doz	8.50	8.00	7.50	
Lath,	1 2 3	₩ doz	8.50	8.00	7.50	
Hunters'		₩ doz	10.50			
M. H. Jones & Co.			dis 45			
Shingling,	1 2 3	₩ doz	$8.00	$8.50	$9.00	
Half Hatchets,	1 2 3	₩ doz	8.00	8.40	9.00	
Claw,	1 2 3	₩ doz	9.00	9.40	10.00	
Lathing,	1 2 3	₩ doz	8.00	8.50	9.00	
Broad,	2 3 4	₩ doz	11.00	12.00	14.50	
"	5 6 7	₩ doz	16.50	18.00	19.50	

Hay Knives.
"Lightning"....₩ doz $20.00 net
Wadsworth's....dis 30 %

Hinges.
Gate, Western....₩ doz $6.25, dis 60&10 %
" N. E....₩ doz $10.13, dis 60&5&10 %
" N. E. Reversible....₩ doz $6.50, dis 60&10 %
Gate, Clark's No. 1....₩ doz $6.00, dis 50 %
" N. Y. State....₩ doz $7.20, dis 60&10 %
" Automatic....₩ doz $12.50 dis 40 %
" Common Sense....dis 20 %
" Seymour's....dis 40&10 %
" Shepard's....No. 25 ₩ doz $6.00, dis 50 %
Rolled Blind Hinges....dis 60&10 %
Rolled Plate....dis 70&10 %
Rolled Raised....dis 70&10 %
Wrought Strap and T, list Dec. 20, '77....dis 60&10 %
Plate Hinges { 6 to 10 in. 5½c ₩ ℔ / "Providence"... over 10 in. 4½c ₩ ℔ }....dis 10 %
Screw Hook and Strap.... { 8, 10, 12 in., 11c / 14 to 36 in., 9½c } dis 50&10 %
Heavy Welded Hook.... { 8 to 12 in., 11c / 14 in. & up, 9½c }..dis 30 %
Screw Hook and Eye.... { ⅝ & 1 in., 10c / ½ in. 12c / ⅜ in. 14c / ¼ in. 16c } dis 35 %

Hoes.—Solid Shank, C. S....₩ doz $5.25, dis 15 %
Socket....₩ doz 5.75, dis 15 %
Riveted Shank....₩ doz 3.25 dis 15 %
Grub....dis 30 %
Planters'....dis 30 @ 35 %
Scovill Pattern....dis 25 @ 30 %
Scovill Pattern, Handled....dis 25 %
Hick's Pat. Solid C. S. Planters'....dis 20&10 @ 30 %
" " " Scovill Pattern dis 20&5 @ 35 %
Winsted & Lane, Planters....dis 25@30 %
" " Scovill Pattern....dis 20@25 %

Hooks.
Bird Cage, Sargent's list....dis 70 %
Cotton....dis 50 %
Cotton (Humason & Beckley Mfg. Co.)....dis 25 %
Belt, (new list) ₩ c....dis 30&10 %
Bench—Hotchkiss', $5.00 ₩ doz....dis 10 %
" Weston's, No. 1, $10.00; No. 2, $9.00 ₩ doz dis 25 %
" McGill's, $3.00 ₩ doz....dis 10 %
" Skinner's, $6.25 per doz....dis 20 %
Clothes Line, Hart's list....dis 60&10&5&10 %
" Sargent's list....dis 66⅔&10 %
" Reading list....dis 45&10&2 %
Ceiling.. / Harness. { Hart's list....dis 70&10 % / Sargent's list....dis 70&10 % / Reading list....dis 45&10&2 % }
Coat and Hat, Hart's list....dis 65&5&10 %
" " Sargent's list....dis 66⅔&10 %
" " Reading....dis 45&5&10&2 %
" " T. & S. Mfg. Co's list....dis 25 %
Tassel (T. & S. Mfg. Co.)....dis 40 %
Wrought Staples and Hooks and Staples, dis 75&10 @ 80 %
" Staples, Stanley's list....dis 40 %
Wire Screw Hooks and Eyes....dis 70&10 %
Grass and Bush....dis 40 %
Whiffletree—Patent....dis 40 %
Hooks and Eyes—Malleable Iron....dis 60&10&10 %
" Brass....dis 60&10&10 %

Horse Nails

	Nos. 5	6	7	8	9	10	
Ausable....₩ ℔	30c	27c	25c	24c	23c	22c	dis 20 %
" Finished, Polished or Blued... "	31c	28c	26c	25c	24c	23c	
Bridgewater Iron Co. Pointed and Polished	26c	23c	21c	20c	19c	18c	
Cortland P't'd & Blued	26c	23c	21c	20c	19c	18c	
Globe (New list)	26	23	21	20	19	18c	net
H. P. Pointed and Finished	26	23	21	20	19	18	dis 20 %
North Western Fini'h'd	26	23	21	20	19	18c	net
" " Plain	25	22	20	19	18	17c	net
National, Pointed and Polished, Pat. Fin.		25	23	22	21	20c	net
Putnam Hammer, P't'd	26	23	21	20	19	18c	net
Vulcan P't'd & Blued	26	23	21	20	19	18c	net

Horse Shoes.—Burden....₩ keg $3.62½
R. I. Horse Shoe Co., Perkins' Improved Light, Medium and Heavy....₩ keg 3.62½
Mule Shoes....₩ keg 4.62½
Perkins' Snow....₩ keg 4.12½

Ice Awls, Chisels, &c.
American Ice Chisel....₩ doz, $6.00 dis 45 %
National....₩ doz $6.25 dis 20 %
Novelty Ice Breakers....₩ doz $6.25 dis 20 %
White's Sliding Head Picks....₩ doz $2.50 dis 40 %
Dunlap's Ring Picks....₩ doz $3.00, dis 25 %
Wood Head Picks, Sargent's....₩ doz $1.85, dis 60&10 %
Iron " ....₩ doz 1.85, dis 60&10 %
Ice Mallets Pick in Head....₩ doz 1.75 net
" Pick in Handle....₩ doz 3.00 net
Ice Axes, Small Cast or Malleable....₩ doz 1.25 net
Kitchen Ice Tongs....₩ doz 2.25 net
Combination Ice Tools....₩ doz $2.50 dis 30&10 %

Kettles.
Brass, 7 to 13 inches inclusive....₩ ℔ 35c net
Brass, larger than 13 inches....₩ ℔ 40c net
Enameled....dis 45 %

Knives.
Ames' Butcher Knives....dis 20 %
" Shoe....dis 15 %
" Bread....₩ doz $1.50, dis 15 %
Moran's Shoe and Bread Knives....dis 20 %
Hay and Straw—"Wadsworth's"....dis 30 %
Table and Pocket....See Cutlery

Knobs.
Carriage (Jap'd 80c. ₩ gross)....dis 60&10 %
Base—Common....dis 30&10 %
" Elastic End, No. 8....dis 70 %
Door, Mineral / " Por. Jap'd / " " Plated / " " Por.....Same discounts as Door Locks.
Furniture, Plain....75c gross inch, dis 10 %
" Wood Screws....dis 20 %
Picture (T. & S. Mfg. Co.)....dis 50 %
" Sargent's....dis 60&10 %
Shutter, Porcelain....dis 60&10 %

Ladles.
Melting—Hart's....dis 55&10 %
" Sargent's....dis 50&10 %
" Reading....dis 15&10 %
" Monroe's Patent....₩ doz $4.00, dis 20 %

Lanterns.
Tubular....No. 0, $10.00; No. 1, $11.50 / With Guards, 50c extra. } net
Hurricane....dis 25 %
Peerless....No 5, ₩ doz $11.75, dis 10&10 %
Brady's Patent....dis 10&10 %
Ætna....dis 10&10 %
Yankee....dis 10&10 %
De Beque....dis 10&10 %
Police..Small, $7.50; Med., $9.00; Large, $12.00, dis 20&10 %
Convex Reflector....$3.60 ₩ doz, dis 10 %

Lemon Squeezers.
Porcelain Lined....₩ doz $4.00 net
Eureka, Tinned....₩ doz $8.00, dis 10 %
Dunlap's Improved....₩ doz $4.00 net
Sammis'...No. 1, $7.50; No. 2, $12.00 ₩ doz., dis 25&10 %
Townsend's Patent....$6.00 ₩ doz., dis 33⅓ %
Lines.—Linen Fish....dis 25 %
Cotton Chalk....dis 50 %
Sil. Lake Chalk....Nos. 0, 1, 2, 3, $6.00, $6.50, $7.00, $7.50....dis 20 %
Mason's Linen....dis 20 %
Wire Clothes, Galvanized....each 30 @ 40c net

Locks and Latches.
Cabinet—Eagle / " Gaylord / " Bridgeport }....dis 25&2 %
" Barnes & Deitz....dis 30 %
Trunk....dis 25 %
Langstroth & Crane's List Jan. 1, '77.
Round Key....dis 40&10 %
Flat Key....dis 33⅓&10 %
Barnes & Deitz, Flat Key....dis 30 %
Yale Lock Co., Flat Key....dis 40 %
Shepardson's, Flat Key....dis 35 %
American Lock Mfg. Co....dis 33⅓ %
Plate....dis 33⅓&5&2 %
F. Many's "Extension Cylinder"....$10.50 ₩ doz, net
DOOR LOCKS, &C.
Branford....dis 60&10&2 %
Norwalk....dis 50&10&2 %
Norwich....dis 50&10&2 %
Russell & Erwin....dis 70&2 %
Mallory, Wheeler & Co....dis 35&10&2 %
Reading Hardware Co....dis 35&10&2 %
Trenton....dis 40&5&2 %
Continental....dis 33⅓ %
Padlocks—Russell & Erwin / " Mallory, Wheeler & Co / " Wm. Wilcox & Co }....dis 33⅓&5 % and 2 % for cash
" American Lock Mfg. Co....dis 33⅓ %
" Romer's....dis 30 %
" Conestoga....dis 60 %
" J. H. McWilliams....dis 10 %
" Barnes & Dietz....dis 30 %
" Penn Lock Works....dis 30 %

Mallets.—Hickory and Lignumvitæ....dis 10&10 %

Meat Cutters.
Dixon's (P. S. & W.) Nos. 1, 2, 3, 4 — ₩ doz..$14.00, 17.00, 19.00, 30.00—dis 25
Miles' Challenge....Nos. 1, 2, 3 — ₩ doz..$22.00, 30.00, 40.00—dis 30 %
Perry's Nos. 1, 2, 3, 4, 4 g'rd, 5 g'rd — Each....$3.00, 4.00, 5.00, 11.00, 13.00, 36.00—dis 40 %
Woodruff's (P. S. & W.)....Nos. 100, 150 — ₩ doz..$15.00, 18.00—dis 40.
Hales'....Nos. 11, 12, 13 — ₩ doz..$33.00, 40.00, 51.00—dis 50&2 %
Draw Cut....Nos. 5, 2, 6, 8, 10 — Each..$50.00, 75.00, 80.00, 225.00, 400.00—dis 20 %
American....dis 25 %
Nos.... 1, 2, 3, 4, B, 5 — Each....$5.00, 7.00, 10.00, 25.00, 50.00, 60.00

Molasses Gates.
Stebbins Pattern....dis 62½&10 %
" Genuine....dis 65&10 %
" Tinned Ends....dis 40&10 %
Chase's Hard Metal....dis 30 %
Bush's....dis 20 %
Lincoln's Genuine....dis 62½&10 %
Weed's....dis 15 %

Nails....See Trade Report
Nuts and Washers.
Square Nuts....7c off list
Hexagon Nuts....8c off list
Washers....7c off list
Nut Crackers
Table (Humason & Beckley Mfg. Co.)....dis 33⅓ %
Blake's Pattern....₩ doz $2.00, dis 10 %

Oakum.
Best....₩ ℔ 9½c
U. S. Navy....₩ ℔ 8½c
Navy....₩ ℔ 7c
Oilers.—Zinc and Tin....dis
Brass and Copper....dis
Olmsted's....dis 40 %
Broughton's....dis 40 %
Malleable (Hammer's)....₩ doz $5.00, dis 10 %
Prior's Patent or "Paragon"....dis 50&10 %
Ox Balls....dis 60&10 %

Pencils.
Faber's Carpenters'....dis 10 %
" Round Gilt....₩ gross $5.25 net
Dixon's Lead....₩ gross 4.50 net
" Lumber....₩ gross 7.50 net

Packing, Steam.
N. Y. Belting and Packing Co. Best....dis 30 %
" " Rubber Back....dis 35 %

Picture Nails and Knobs.
Brass Head, Sargent's List....dis 50&10&10 %
" T. & S. Mfg. Co....dis 50 %
Porcelain Head, Sargent's List....dis 50&10&10 %
" " Judd's List....dis 40 %
Porcelain Head, T. & S. Mfg. Co....dis 40 %
Pinking Irons....₩ doz 75c. net

Plaiting Machines.
Magic....₩ doz $10.00, net
Astor Plaiting Machine....each $15.00, dis 20 %
Crown Plaiting Machines....dis 25 %
6in., $6.00. 10in., $10.00, each.

Planes and Plane Irons.
Bench, First Quality....dis 35&10 %
" Second " ....dis 50&10 %
Moulding....dis 35&10 %
Bailey's (Stanley R. & L. Co.) new list Jan. '79.dis 25&10 %
The Stanley (S. R. & L. Co.) " ....dis 25&10 %
Bailey's "Victor"....dis 25&10 %
Defiance Adjustable, new list....dis 25&10 %
D. R. Barton Tool Co....dis 20 %
Plane Irons, Butcher's....$5.50 to £
" Buck Bros....$5.00 to £
" Auburn Tool Co.'s....dis 25 %
" Defiance....dis 25&10 %
" D. R. Barton Tool Co....dis 20 %
" Middletown Tool Co....dis 10 %
" Ohio Tool Co....dis 20&10 %
" Spear & Jackson's....$5.00 to £
" Sandusky Tool Co....dis 10&10&10 %

Pliers and Nippers.
Button's Patent....dis 33⅓ %
Hull's Patent Nippers, No. 1, $15; No. 2, $21 ₩ doz, dis 25 %
Humason & Beckley Mfg. Co....dis 33⅓ %
Gas Pliers....dis 40 %
Eureka Pliers and Nippers....dis 25 %
Russell's Parallel....dis 25 %
P. S. & W. Cast Steel....dis 35 %
" " End Cutting Nippers....dis 25 %
" Tinners' Cutting Nippers....dis 20 %

Plumbs and Levels.
Disston's....dis 70 %
Stanley R. & L. Co.'s Pat. Adjustable....dis 65&10 %
" " " Non-Adjustable....dis 65&10 %
Chapin's Patent Adjustable....dis 65&10 %
" Non-Adjustable....dis 65&10 %
Standard Rule Co.'s New Adjustable....dis 60&10
" " Non-Adjustable....dis 60&10
Johnson's Patent Adjustable....dis 60&10 %
Davis' Patent....dis 60&10 %
Pocket Levels....dis 65&10 %

Post Hole and Tree Augers.
Samson Post Hole Digger....per doz $36.00, dis 20 %
Fletcher Post Hole Augers....₩ doz 36.00, dis 20 %
Vaughan's Post Hole—
6 in. $23.60; 7, 8 and 9 in. $25 per doz....dis 20 %
Leed's....$5.00 each, dis 45 %
Eureka....₩ doz $40.00, dis 40 %

Potato Parers, &c.
Bay State....₩ doz $13.00 dis 10 %
Saratoga "Peeler and Slicer....₩ doz 7.75 dis 10 %

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw per doz $18.00, dis 20 %
" Pruning Hook.... " 11.50, dis 20 %
Pruning Shears....₩ doz $5.00 net

Pulleys.
Judd's Axle....₩ doz $0.50, dis 40 %
Hot House and Tackle....dis 66⅔&10 %
Jap'd Screw....dis 66⅔&10 %
Brass Screw....dis 60&10 %
Jap'd Side....dis 66⅔&10 %
" Clothes Line....dis 66⅔&10 %
Hay Fork Solid Eye, $4.50; Swivel, $5.00, dis 40&10&10 %
" " "Anti-Friction,"....$7.50 dis 20 %
" " "F" Common and Pat. Bushed....dis 20 %
" " Tarbox Pat. Iron....dis 30 %
Shade Rack....dis 50 %

Punches.
Belt or Drive....₩ doz $2.00; 2.25; 2.50, dis 40 %
Bemis & Call Co.'s Cast Steel Drive....dis 40&30 %
" Springfield Socket....dis 50&10 %
Spring....₩ doz $7.00, dis 40&5 %
" Leach's Patent....dis 15 %
Bemis & Call Co.'s Spring and Check....dis 50 %
Solid, Tinners'....₩ doz $1.44, dis 30 %

Rail.
Sliding Door Wrought Brass....₩ ℔ 38c dis
" " Iron, Painted....₩ foot 9c, dis 60 %
Barn Door, ½, ⅝ and ⅞ inch....dis 75&10 %
" for N. E. Hanger....dis 70&10 %

Rakes.
Cast Steel....dis 15 %

8	10	12	14	16 teeth.
$5.00	5.75	6.50	7.25	8.00

Malleable....dis 15 %

10	12	14 teeth.
$3.60	4.00	4.40

Razor Strops.
Genuine Emerson....dis 30@33⅓ %
Badger's Emerson....dis 33⅓ %
Badger's (not Emerson)....dis 25 %
Evans'....dis 40 %
Imitation Emerson....₩ doz $2.75, dis 40&10 %
Hunt's....dis 40&5 %
Chapman....dis 15 @ 20 %
Torrey's....dis 25 %
Saunder's....dis 10 @ 15 %

Rivets.
Iron and Tinned....dis 50 %
In bulk, new list of Jan. 10, 1878....dis 40 %
Copper Rivets and Burs....dis 50 %

Nos.	7	8	9	10	11	12	13	14	15
₩ ℔	49c	50c	52c	54c	56c	58c	60c	64c	70c

Tinned Iron Belt Rivets and Burs....dis 40 %
Rivet Sets....dis 40 %

Rods.
Stair....dis 50&10 %
" American Patent....dis 40 %

Rollers.
Barn Door, Sargent's list....dis 70&5&10 %
Novelty....dis 10 %
Acme (Anti-Friction)....dis 50 %

Rope. Manufacturers' Net List, December, 1878.
Manila....½ inch and larger ₩ ℔ 11¼c
" ....⅜ inch ₩ ℔ 11¾c
" ....¼ and 5-16 inch ₩ ℔ 12¼c
" Tar'd Rope....₩ ℔ 10¾c
" " Lath Yarn....₩ ℔ 12¼c
" Hay Rope....₩ ℔ 11¼c
Sisal....½ inch and larger ₩ ℔ 9¼c
" ....⅜ inch ₩ ℔ 9¾c
" ....¼ and 5-16 inch ₩ ℔ 10¼c
" Hay Rope....₩ ℔ 9¼c

Rules. Boxwood. Ivory.
Chapin's / Standard / Willis, Thrall & Son / Stephens / Stanley....Boxwood: dis 70 &10 % — Ivory: dis 60 &10 %

Sad Irons.
From 4 to 10 lbs....₩ ℔ 2¼@2½c net
Self-Heating....₩ doz $8.75 net
" Tailors'....₩ doz $17.50 net
Gleason's Shield and Toilet....dis 25 %
Enterprise Patent Cold Handle....dis 33⅓ %
Mrs. Pott's Pat. Cold Handle, "Crown"....dis 33⅓ %
Combined Fluter and Sad Iron..per doz $15.00, dis 15 %

Sand Paper.
Baeder & Adamson's Flint, 00 to 1½..$4.25 ₩ ream }
" " " 2, 2½ & 3. 4.75 ₩ ream } dis
" " " Assorted 4.25 ₩ ream } 20 %
" " Star....3.25 ₩ ream }
" " Emery..₩ ream $6.50 @ 11.50 }
New England, same list as B. & A. Flint....dis 20 %
Gage's....dis 20&5 %

Sash Cord.
Common....₩ ℔ 16 @ 15c net
Patent....₩ ℔ 18c net
Silver Lake, Russia Flax....₩ ℔ 55c net
" White Cotton....₩ ℔ 55c net
" Drab Cotton....₩ ℔ 60c net
Raw Hide....dis 25 %
Steel Ribbon....dis 10 %

Sash Locks.
Clark's, No. 1, $10.00; No. 2, $8.00 per gross...dis 40@45 %
Ferguson's....dis 33⅓ %
Walker's....dis 10 %
Hammond's Window Springs....dis 25 %
Northup Window Springs....$9.00 per gross, dis 10 %
The Perfect, Clark & Smith, Plain Jap'd ₩ gro $10.00 net
" " Por. Knob Jap'd. ₩ gro 14.00 net
" " Nickel-Plated...₩ gro 27.00 net
Sash Weights.—Solid Eyes....₩ ℔ 1 @ 1¼c

Sausage Stuffers or Fillers.
Miles....₩ doz $20, dis 30 %
Perry....₩ doz, No. 1, $15; No. 0, $21, dis 40 %
Draw Cut No. 4....each $30.00, dis 20 %
Enterprise Mfg. Co....dis 20 %
Silver's....dis 25 %

Saws.
Disston's Circular....dis 35 %
" Mill....dis 20 %
" Cross Cut....dis 20 %
" Hand, Panel, Rip, &c....dis 20 %
E. M. Boynton's Lightning, Cross Cuts....dis 50&5 %
" One-Man, all lengths....dis 40&5 %
" Billet Webs....₩ doz $10, dis 40&5 %
Wheeler & Clemson Mfg. Co.'s Hand....dis 20 %
" " Cross-Cut....dis 35 %
Livingston's Butcher and Kitchen....dis 20 %
" Framed Wood—

Nos.	101	102	103	104	105	
Per doz	$10.00	8.[illegible]	10.00	7.50	6.25	net

Saw Frames.
White, Vermont....₩ doz $1.35, dis 15 %
Red, Polished and Varnished....₩ doz $2.00, dis 15 %
Saw Rods....$10 list dis, 10&10 %

Saw Sets.
Boynton's Patent....dis 40 %
Stillman's Genuine....₩ doz $4.25 net
" Imitation....₩ doz $3.25, dis 35 %
Common Lever....per doz $2.00, dis 35 %

Leach's..................No. 0, $8.00; No. 1, $15.00, dis 15 %
Nash's..................No. 1, $8.50; No. 2, $5.50, dis 20&10 %
Hammer, Hotchkiss..................$5.50, dis 10 %
" Bemis & Call Co.'s New Pat.......dis 40&5 %
Bemis & Call Co.'s Lever & Spring Hammer.dis 35&10 %
" " Plate and Cross Cut..........dis 20 %
Aiken's Genuine..................$13.00, dis 50 %
" Imitation..................$7.00, dis 45 %
Hart's Patent Lever..................dis 20 %
Disston's..................dis 20 %

Scales.
Hatch, Counter.................. ₩ doz $56, dis 40&2 %
" Tea.................. ₩ doz $15.00 dis 50 %
Union Platform..................$6.00, dis 50 %
Turnbull's Market..................dis 20 %
Fairbanks'..................dis 20&5 %
Howe's..................dis 20&5 %
Chatillon's Grocers'..................dis 40 %
" Eureka..................dis 20 %
Family Universal..................dis 25 %
" Favorite..................dis 25 %
" Turnbull's..................dis 25 %
Scale Beams, Chatillon's list..................dis 25 %
" Sargent's list..................dis 60&10 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.), $6.50.dis 25&10 %
Box, 1 Handle.................. ₩ doz $5.00, dis 10 %
" 2 " .... ₩ doz 6.00 dis 10 %
Defiance Box and Ship..................dis 25&10 %
Foot..................dis 60&10 %
Ship (common)..................per doz $3.00 net
" (Providence Tool Co..................dis 10 %

Screw Drivers.
Hart, Bliven & Mead..................dis 45&10&2 %
Douglass Mfg. Co..................dis 35&1 %
Disston's..................dis 52½ %
Disston's Patent Excelsior..................dis 52½ %
Buck Bros..................dis 25 %
Stanley Rule & Level Co., Varnished Hdls..dis 50&10 %
" " " Black Handles...dis 40&10 %
Sargent & Co.'s..................dis 60&10 %

Screws.
Flat H'd Iron..................dis 60 %
Round Head Iron..................dis 45 %
Flat Head Brass..................dis 45 %
Round Head Brass..................dis 30 %
Brass and Silver Capped..................dis 40 %
Japanned, list of Plain Screws..................dis 55 %
Lag or Common Coach..................dis 70&5 %
Coach Patent Gimlet Point..................dis 40 @ 45 %
Bed..................dis 10 %
Machine, Flat Head, Iron, Am. Screw Co..................dis 25 %
" Round Head, Iron, " " ....dis 20 %
Bench, Iron..................dis 60&10 %
" Wood, Beach.................. ₩ doz $3.00, net
" " Hickory..................dis 20&10 %
Hand..................dis 25&10 %
Hand Rail, Sargent's..................dis 60&10 %
" " Humason, Beckley & Co.'s..................dis 40&10 %
Jack (Wilson's)..................dis 35 %
Sash (T. & S. Mfg. Co.)..................dis 25 %

Shears and Scissors.
Cast Steel..................dis 80 %
" Iron, 'American'..................dis 50 @ 55 %
Seymour's Straight Trimmers..................dis 65 %
" Scissors..................dis 65 %
Pruning..........see Pruning Hooks and Shears.
Barnard's Lamp Trimmers.................. ₩ doz $3.75
Tinners'..................dis 20 %
Heinisch Trimmers and Scissors..................dis 60 %
" R. H. S. " " ....dis 65 %

Sheaves.
Sliding Door, M. W. & Co., list..................dis 35&10&2 %
" R. & E. list..................dis 50&2 %
" Patent Roller..................dis 25&2 %
" " " Hatfield's..................dis 50 &2 %
" Russell's Anti-Friction..................dis 50&2 %
" Moore's Anti-Friction..................dis 45 %
Sliding Shutter, R. & E. list..................dis 50&2 %
" " Sargent's list..................dis 55&10 %
Moore's Anti-Friction (Hanging)..................dis 45 %
Philadelphia Hanging..................dis 40&5&2 %

Shovels and Spades.
Ames, New list, Jan. 1, '79..................dis 20 %
Kimball Shovel Co..................dis 20 @ 20&5 %
Old Colony..................dis 30 %
Remington's (Lowman's Patent)..................dis 30 %
Dunning's Shovels and Scoops..................dis 20&7½ %
B. Rowland's "Regular," new list..................dis 60 %
" Patent, new list..................dis 40&5 %
Oxford Patent, new list..................dis 40&5 %

Shovels and Tongs.
Iron and Brass Head, R. & E. list..................dis 50&2 %
" " Hart's..................dis 50&10&2 %
Polished Steel..................new list, dis 50&10&2 %

Slates.
Square Frames, Round Cornered, by case..................dis 70 %
Less than a case..................dis 65&10 %

Spoke Shaves.
Defiance Metallic..................new list, dis 25&10 %
Iron..................dis 40&10 %
Wood..................dis 30 %
Bailey's (Stanley R & L. Co.) new list..................dis 25&10 %

Spoke Trimmers.
Bonney's.................. ₩ doz $10.00, dis 40 %
Stearn's.................. ₩ doz $10.00, dis 40 %
Ives'..........No. 1, $15.00; No. 2, $12.00 ₩ doz, dis 40&10 %
Douglass'.................. ₩ doz $9.00, dis 20&10 %

Spoons.
Tinned Iron..................dis 15 %
Basting..................dis 30 %
Britannia..................dis 65&5 %
Derby Silver Co..................dis 40&5&5 %
L Boardman's Sons, A1..................dis 40&5&5 %
Rogers & Bro., A 1..................dis 40&5 % cash
Reed & Barton..................dis 40&5 %
Hall & Elton..................dis 40&5 %
Holmes, Booth & Haydens..................dis 40&5 %
German Silver..................dis 30&10&5 %
Diamond Steel (L. Boardman's Sons)..................dis 30&5 %
Tin (P. S. & W.), Teas..................$1.50 ₩ gross, net
" " Tables..................$2.50 ₩ gross, net
Tin Cowles Hdw. Co.)..................dis 10 %
" " " case lots..................dis 20 %

Stocks and Dies.
"Lightning" Screw Plate..................dis 5&10 %
..................dis. 10 %

Stone.
Hindostan Stone.................. ₩ ℔ 6c }
" Ax Stone.................. ₩ ℔ 8c } dis 30&10 %
" Slips.................. ₩ ℔ 10c }
Sand Stone.................. ₩ ℔ 6c, dis 30&10 %
Washita Stone..................No 1, ₩ ℔ 20c }
" ....No 2, ₩ ℔ 16¾c }
" Slips..................No. 1, ₩ ℔ 45c } dis
Arkansas Stone..................No. 1, ₩ ℔ $1.00 } 10 %
" ....No. 1, ₩ ℔ $0.85 }
" Slips..................No. 1, ₩ ℔ $2.25 }
Turkey Oil Stone (Boyd & Chase)....4 to 8in, $1.00 ₩ ℔, dis 10 %
" Slips " ....$2.50 ₩ ℔, dis 10 %
Lake Superior (Boyd & Chase).................. ₩ ℔ 20c, dis 10&5 %
" " Slips " .... ₩ ℔ 45c, dis 10&5 %
Grindstones, Family, Loring's..................dis 10 %

Stove Polish.
Joseph Dixon's.................. ₩ gross $6.00, dis 5 %
Gem.................. ₩ gross $4.50, dis 5 %
Gold Medal.................. ₩ gross $6.00, dis 25 %
"Mirror".................. ₩ gross $6.00, dis 5 %
Ruby.................. ₩ gross $3.75, net
Rising Sun.................. ₩ gross $5.75, net

Squares.
Steel..........dis 50 %; full cases, dis 50&10 % }
Iron..........dis 50 %; full cases, dis 50&10 % } 2 %
Nickel Plated.........add $2.50 @ $4.00 ₩ doz, net } cash
Try Squares and T Bevels..................dis 50&10 %
Star Try Squares and Bevels..................dis 35 %
Disston's Try Squares and T Bevels..................dis 52½ %
Winterbottom's Try and Mitre..................dis 25&10 %
Bailey's Try Squares and T Bevels..................dis 25&10 %

Tacks, Brads, &c.
List of May, 1878..................dis 55 @ 55&10 %
Shoe Nails, (new list)..................dis 10 %
Double-Pointed Tacks..................dis 40&5 %

Tap Borers.
Common and Ring..................dis 20&10 %
Ives' Tap Borers..................dis 10&10 %
Enterprise Mfg. Co..................dis 20 %

Tapes, Measuring.
American..................dis 25 %
Spring Tapes..................dis 25&10 %

Thermometers.
Tin Case..................dis 70 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion)..................dis 20 %
Wood Bottom.................. ₩ doz $12.00, dis 30&10 %
All Iron.................. ₩ doz $10.50, dis 40&5 %
Nashua Lock Co.'s.................. ₩ doz $18.00, dis 50 %

Toe Calks.—Winsted.................. ₩ ℔ 10c, dis 10 %

Tinners' Tools and Machines.
Machines (P. S. & W.)..................dis 5@10 %
Tools (P. S. & W.)..................dis 15@20 %

Traps.
Game, Newhouse..................dis 33⅓ %
" Newhouse Pattern..................dis 60&10 %
" Blake's Patent..................dis 40&10 %
Mouse, Wood, Choker.................. ₩ doz holes, 12 @ 13c
" Round Wire.................. ₩ doz $1.50, dis 10 %
" Cage.................. ₩ doz $2.50, dis 10 %
" Patent Self Setting.................. ₩ doz holes, 25c, net
" Catch-em-alive.................. ₩ doz $2.75, dis 10 %
Rat. "Decoy"..................per doz $10.00, dis 10 %

Trowels.
Lothrops Brick and Plastering..................dis 15 @ 20%
Reed's Brick and Plastering..................dis 15 %
Disston's Brick and Plastering..................dis 20 %
Peace's Plastering..................dis 20 %
Clement & Maynard's..................dis 20 %
Rose's Brick..................dis 20 %
Brades' Brick..................dis 15 %
Worrall's Brick and Plastering..................gold, dis 20 %
Garden..................dis 50 %

Triers.
Butter and Cheese..................dis 25 %

Vises.
Solid Box, Trenton...New List, Jan. 22, '79, dis 35 %
" Wilsons.......New List, Jan. 22, '79, dis 35 %
" "Crown" (A. H. Hildick's) 40 to 100 lbs.,
15c currency..................dis 20 %
" Park, Long & Co., new list Jan. 22, '79.dis 35 %
" Peter Wrights..................dis 15 %
Parallel, Parker's..................15½c
" Wilson's..................dis 20 %
" Howard's..................dis 45 @ 50 %
" Merrill's..................dis 25 %
" Sargent's..................dis 20 %
" Trenton..................dis 60&10 %
" Backus and Union..................dis 25 %
" Fisher & Norris..................dis 25 %
" Stevens'..................dis 15&10 %
" Simpson's Adjustable..................dis 25 %
"Family," List..................dis 25&10 %
Saw Filers, Bonney's..................net
" Stearn's.................. ₩ doz $24.00, dis 20&10 %
" Hopkins'..................dis 20&10 %
Lowell Hand Vises.................. ₩ doz $17.50 dis 10 %
Richardson's Vise and Anvil..................dis 20 %
..................dis 25 %

Ventilators.
Protective (upper) per foot, $1.00.................. } dis 25 %
" (lower) " 1.50.................. }

Washer Cutters.
Smith's Patent.................. ₩ doz $12.00 dis 10 %
Johnson's.................. ₩ doz $12.00, dis 20&10 %
Penny's.................. ₩ doz $14.00 and $16.00, dis 35&10 %
Appleton's.................. ₩ doz $8.00, dis 10&10 %

Washers.—See Nuts and Washers.

Weather Strips.
Protective Ventilator Co. s..................dis 25 %

Well Wheels.—Revised list..................dis 60&10 %

Wire.
Brass and Copper.......List of July 1, 1878 dis 10&10 %
Bright and Annealed.........Nos. 0 @ 18, dis 55 @ 57½ %
" " ....Nos. 19 @ 26, dis 60 @ 62½ %
" " ....Nos. 27 @ 36, dis 65 @ 67½ %
Coppered..................Nos. 0 @ 18, dis 50 @ 55 %
Galvanized, Nos. 0 to 6.................. ₩ ℔ 10c, dis 35 @ 37½ %
" Nos. 7 to 18.....market list, dis 35 @ 37½ %
Tinned, Nos. 0 to 18..................dis 42½ @ 47½ %
Cast Steel..................dis 25 @ 30 %
Tinned Broom Wire, Nos. 18 to 25..................dis 50 @ 55 %
Annealed Fence, Nos. 8 and 9..................dis 57½ @ 60 %
" Grape, Nos. 10 to 14..................dis 57½ @ 60 %
Galvanized Telegraph, Nos. 7 to 9.................. ₩ ℔ 8½c
" Nos. 10 and 11.................. ₩ ℔ 9½c
" No. 12.................. ₩ ℔ 10c
Fence Staples.................. ₩ ℔ 7 @ 7½c
" Staples, Galvanized.................. ₩ ℔ 9½ @ 10c
Stubs Steel Wire..................$7.00 to £ gold
Japanned Barb Fence.................. ₩ ℔ 15c
Galvanized " .... ₩ ℔ 16c
Steel Music Wire, Nos. 12 to 27.................. ₩ ℔ $1.00, net
Judd's Picture Wire..................dis 80&20 %
Clothes Line Wire, Galvanized.................. ₩ coil 30 @ 40c net

Wrenches.
American Adjustable..................dis 45 %
Baxter's Adjustable "S,"..................dis 20 %
" Diagonal..................dis 20 %
Collins & Co.'s..................dis 45 %
Coes' Genuine..................dis 60&10 %
" Pattern (Wrought)..................dis 70 %
" " (Malleable)..................dis 75&10 %
Girard..................dis 50&10&10 %
Lindsay's " ....dis 25 %
Taft's Pattern..................dis 75&10 %
Davis' Patent Duplex..................new list, dis 25 %
Bemis & Call's Patent Combination..................dis 25 %
" " Merrick's Pattern..................dis 40&5 %
" " Briggs' Pattern..................dis 35 %
" " Cylinder or Gas Pipe..................dis 25&30 %
Aiken Pocket (Bright)..................$8.00, dis 55&10 %
The Favorite Pocket (Bright)..................per doz $8, dis 60 %

Wringers. Per doz.
Universal, Cog Wheels, No. 2½..................$60.00
" " " No. 2,..................63.00
" " " No. 1½..................71.00
Crown No. 2..................54.00
" No. 2½..................63.00
" No. 3..................69.00
Eureka, No. 1..................57.00
Novelty, No. 10, with Cog Wheels..................60.00
" No. 2, " " 63.00
Excelsior, No. A, with Folding Bench..................84.00
" No. E, for Set Tubs..................66.00
Keystone No. 1, Wood Frame, no Gear..................54.00
" No. 2, Iron " " 54.00
" No. 10. Wood " Common Gear..................60.00
Peerless, No. 0, no Cogs..................51.00
" No. 1, " 54.00
" No. 2½, with Cogs..................60.00
" No. 2, " 63.00
" No. 3, " 71.00
" No. 4, " 93.00

Stamped Tinware.—New List Dec. 1, 1878.
Common Stamped Ware..................dis 25 %
Stamped Deep and Retinned Ware..................dis 25 %

METALS.

IRON.—DUTY: Bars, 1 to 1½c. ₩ ℔; Sheet, Band Hoop and Scroll, 1¼ to 1¾c. ₩ ℔; provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 ₩ ton; Polished Sheet, 3c. ₩ ℔; Wrought Scrap, $8 ₩ ton; Cast Scrap, $6 per ton. Railroad 70c. ₩ 100 ℔s. Boiler and Plate, 1½c. ₩ ℔.

Pig Iron—AMERICAN.
Foundry No. 1.................. ₩ ton $16.50 @ 18.00
" No. 2.................. ₩ ton 15.50 @ 16.50
Gray Forge.................. ₩ ton 14.50 @ 15 50

SCOTCH.
Eglinton.................. ₩ ton 19.50 @ 20.00
Coltness.................. ₩ ton 22.00

Rails.
Iron, at mill.................. ₩ ton $32.00 @ 35.00
Steel, " .... ₩ ton 41.00 @ 42.00
Old Rails.................. ₩ ton 19.50 @ 20.00

Scrap.
Wrought Scrap, from yard.. ₩ ton, nom. 21.00 @ 22.00

Bar Iron, from Store.
Common Iron:
⅜ to 2 in. round and square.................. }
1 to 6 in. x⅜ to 1 in.................. } ₩ ℔ 1 75c
Refined Iron:
⅜ to 2 in. round and square.................. }
1 to 6 in. x⅜ to 1 in.................. } ₩ ℔ 2.0c
1 to 6 in. x¼ and 5-16.................. ₩ ℔ 2.2c
Rods—⅝ and 11-16 round and square.................. ₩ ℔ 2.1c
Bands—1 to 6x3-16 to No. 12.................. ₩ ℔ 2.4c
Swedish Iron:
Ordinary sizes..................5?

COPPER.—DUTY: Pig, Bar and Ingot, 5c; Old Copper, 4c ₩ ℔; Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.
American Ingot.................. ₩ ℔ See Trade Report.

SHEATHING, BRAZIERS' COPPER, BOLTS, &c.
Braziers' Copper, ordinary sizes, over 16 oz., ₩ sq. ft.................. ₩ ℔ 25c
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., ₩ sq. ft.................. ₩ ℔ 27c
Braziers' Copper, 10 oz and 12 oz., ₩ sq. ft.................. ₩ ℔ 29c
" Lighter than 10 oz. ₩ sq. ft.................. ₩ ℔ 31c
Circles less than 84 in. in diameter.................. ₩ ℔ 28c
Circles 84 in. diameter and over.................. ₩ ℔ 31c
Segment and Pattern Sheets.................. ₩ ℔ 28c
Locomotive Fire Box Sheets.................. ₩ ℔ 26c
Sheathing Copper, over 12 oz. ₩ sq. ft.................. ₩ ℔ 23c
Bolt Copper.................. ₩ ℔ 25c
Copper Bottoms.................. ₩ ℔ 25c
No Copper is Sheathing except 14x48 inches and not to exceed 34 oz. to the sq. ft.

TINNING.
14x48, by the case.................. ₩ sheet 6c
14x48, less than case.................. ₩ sheet 8c
For tinning both sides, double the above amount.
O'NEILL'S PATENT PLANISHED COPPER.—Dis 7½ @ 10 %

14x48.
14 and 16 oz. and heavier.. ₩ ℔ 34c By the case. ₩ ℔ 33c
12 oz. and lighter.......... ₩ ℔ 37c " " . ₩ ℔ 36c

Boiler Sizes.
7 in., 14x52. 8 in., 14x56. 9 in., 14x60.
14 and 16 oz. and heavier. ₩ ℔ 36c By the case. ₩ ℔ 35c
(And all sizes not over 20 in. wide.)

30x60.
14 and 16 oz. and heavier.................. ₩ ℔ 38c
12 oz.................. ₩ ℔ 41c

Sheet Iron.

	Common American.	R. G. American.
Nos. 10 to 20	₩ ℔ 2⅝c	3⅝
21 to 24	₩ ℔ 3c	4
25 to 26	₩ ℔ 3¼c	4¼
27	₩ ℔ 3⅜c	4⅜
28	₩ ℔ 3⅝c	4½c

Galvanized, 14 to 20, B. B. ₩ ℔ 6½c; 2d qual. ₩ ℔ 5½c
" 21 to 24, " ₩ ℔ 7½c; " ₩ ℔ 6 c
" 25 to 26, " ₩ ℔ 7¾c; " ₩ ℔ 6½c
" 27 " ₩ ℔ 8¼c; " ₩ ℔ 7 c
" 28 " ₩ ℔ 9 c; " ₩ ℔ 7½c
Patent Planished.................. ₩ ℔ A, 10½c; B, 9½c
Russia.................. ₩ ℔ Nos. 8 to 12, 13c; 13 to 16, 12c
American Cold Rolled.................. ₩ ℔ 4½c

Brass.
Brown & Sharp's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.
BRASS MANUFACTURERS' PRICE LIST.—dis nominal. July 1, 1878.
Cash prices for Roll and Sheet Brass. For less quantity than 100 ℔s. add 3c ₩ ℔.

HIGH BRASS.
All Nos. not thinner than to No. 28, wider than 2 in., not wider than 14 in..................25c
All Nos. to No. 28, inclusive, and widths over 14 to 20 in., inclusive..................30c
All Nos. to No. 28, inclusive, and widths over 20 to 30 in., inclusive..................33c
½c. ₩ ℔ advance on each No. above Nos. 28 to 38, inclusive.
All Brass thinner than No. 38 is Platers' Brass, at...48c
Sheets 24x48, and all sheets cut to particular sizes and lengths under 30 in., in width wider than 2 in..32c
Printers' Rules..................40c
Sheets wider than 30 in. and under 40 in..................42c
" 40 in. and over..................45c
Circular Sheets, in diam. from 4 in. to 14, inclusive..35c
" " over 14 " 20, " ..40c
" " " 20 " 30, " ..44c
" " " 30 " 40, " ..50c
" " " 40 in..................54c

LOW BRASS.
4c ₩ ℔ more than High Brass.
Gilding Metal, 8c ₩ ℔ more than High Brass.
Platers' or Gold Metal { In Bars..................43c
{ Sawed..................40c
{ Planed or Polished..................49c

FOR SLITTING.
Metal in width 2 in. to ½ in. to No. 28, inclusive, 1c. ₩ ℔ advance.
Metal, in width 2 in to 1 in., thinner than No. 28, 2c. ₩ ℔ advance.
Metal, in width 1 in. to ½ thinner than No. 28, 3c ₩ ℔ advanc
Metal, in width ½ in. to ¼, inclusive, not thinner than No. 28, 2c. ₩ ℔ advance.
Metal, in width ½ in. to ¼ thinner than No. 28, 5c. ₩ ℔ advance.
Metal, ¼ in. in width and less, 10c. ₩ ℔ advance.
Any of the above widths cut to particular lengths, add 7c. ₩ ℔.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire.
4 per cent., 12 inch, to No. 26	$0.52	$0.70
6 " " "	56	70
10 " " "	64	.88
15 " " "	.74	1.03
18 " " "	.80	1.12

German Silver Sheets over 12in. wide and weighing more than 10 ℔s., $2.00 @ ℔.
Advance 2c. for each additional inch in width above 12 in., and 2c. ₩ ℔ on each No. thinner than Nos. 26 to 36, inclusive
All German Silver thinner than No. 36 is Platers, at 50c ₩ ℔ additional.
German Silver Scrap one-half less than net price of 12 in. Market Metal. German Silver Turnings, Filings and Chips, half the price of Scrap.

BRASS AND COPPER WIRE.

	High Brass.	Low Brass.	Gild'g and Copper.
No. 0 to 20	$0.28	0.32	$0.38

No. 21	.31	$ .35	.41
No. 22	.32	36	.42
No. 23	.33	.37	.43
No. 24	.35	39	.45
No. 25	.38	.42	.48
No. 26	.40	.44	.50
No. 27	.43	.47	.53
No. 28	.47	.51	.58
No. 29	.50	.54	.61
No. 30	.53	.57	.67
No. 31	.57	.61	.73
No. 32	.61	.65	.79
No. 33	.65	69	.88
No. 34	.69	.73	.98

Spring Wire 2c ₩ ℔ advance.
Flat, Square and Half Round Wire 5c ₩ ℔ advance on Round Wire.
Fancy Wire not less than 10c ₩ ℔ advance of Round Wire.
Brass Rods, No. 8 and larger not less than 2 feet lengths, 33c.
Wire straightened and cut, smaller than No. 8, and not less than 2 feet lengths, 38c.
Wire and Rods less than 2 feet lengths, special rates.
Twelve cents per ℔ extra for spooling on 1 ℔ spools.

MISCELLANEOUS.
Common Plain Brass Pail Ears..................$0.36
Brass Door Rail...................38

SCRAP.—net.
High Brass Scrap..................11c
Low " 13c
Gilding..................15c
Turnings, Filings and Chips half the price of Scrap.
Terms—Net cash. Interest to be added after thirty days.

TUBING.—dis 10 % ₩ ℔
Plain to No. 20 inclusive, above ¼ in. to 3 in..........$0.38
" above 3 in...................48
Nos. 21, 22, 23, two cents advance on List for each Number.
Nos. 24, 25, 26, four cents advance on List for each Number.
Above No. 26, special rates.
Plain, ¼ inch...................65
" 3-16 " 1.05
" ⅛ " 1.55
All Mandrel Drawn Tubes, 5 cents advance on List Prices.
Fancy Tubing to No. 20.................. 45c
English, Scotch and Extra Patterns Fancy Tubing to No. 20...................50
Tubing Sawed or Cut 2 to 4 feet long, 2 cents advance on List.
Add to 2 cents ½ cent for each additional cutting under 2 feet.
All Mandrel Drawn Tubes under ⅜ in., 25 cents per pound advance.

ZINC TUBING.—net.
Plain...................22
Fancy...................28
Scotch and Extra Patterns...................31

GERMAN SILVER TUBING.—dis 10 %
4 Per cent...................75
6 " 85
9 " 1.00
12 " 1.15
15 " 1.20
16 " 1.35
18 " 1.45
20 " 1.55

STEEL.—DUTY: Bars, Ingots, Sheets and Coils, valued at 7 cents ₩ ℔., or under, 2¼ cents; over, 7 cents, and not above 11, 3 cents ₩ ℔; over 11, 3½ cents ₩ ℔, and 10 % ad val. Railway Bars, 1¼ cents ₩ ℔. Railway Bars, in part Steel, 1 cent ₩ ℔. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.
Tool..................15c
Spring..................7c
Homogeneous..................12½c
Boiler Plate..................8c
Tire..................5½c
Machinery (round and square)..................9c
File..................9c
Sheet..................11 @ 16c
Saw Plate, mill and mulay..................14 @ 16½c
" gang and X cut..................13 @ 14c
" circular as to size..................18 @ 30c

Chrome Steel.
Tool.................. ₩ ℔ 14 @ 15c
Tool, extra fine.................. ₩ ℔ 40 @ 75c
Spring.................. ₩ ℔ 8 @ 9c
Machinery.................. ₩ ℔ 8 @ 10c
Gun or Homogeneous.................. ₩ ℔ 12 @ 16c

English Steel.—
" Best Cast.................. ₩ ℔ 15½c
" Extra Cast.................. ₩ ℔ 16½c
" Round Machinery, Cast.................. ₩ ℔ 10c
" Swaged, Cast.................. ₩ ℔ 18c
" Best Double Shear.................. ₩ ℔ 15½c
" Blister, 1st quality.................. ₩ ℔ 13c
German Steel, Best.................. ₩ ℔ 11c
" 2d quality.................. ₩ ℔ 10c
" 3d quality.................. ₩ ℔ 9c
Sheet Cast Steel, 1st quality.................. ₩ ℔ 15½c
" 2d quality.................. ₩ ℔ 14½c
" 3d quality.................. ₩ ℔ 12½c

ANTIMONY..................13½ to 14c

LEAD.—DUTY: Pig $2 ₩ 100 ℔s; old Lead, 1½c ℔ ₩ Pipe and Sheet, 2½c ₩ ℔.
American..................5c
Bar..................5½c, dis 10 %
Pipe..................5½c, dis 10 %
Tin Lined Pipe..................12c, dis 10 %
Sheet..................6½c, dis 10 %
Shot..................Drop 6½c, Buck, 7½, dis 10 %

BABBITT METAL.
N. P. U.................. ₩ ℔ 6 @ 70
A 20c; B, 16c; C, 12c; D 10c ₩ ℔.

TIN.—DUTY: Plates, Sheets, Tagger and Terne, 1.1c ₩ ℔; Electro-galvanized Plates, 2c ₩ ℔; Manufactures of, not enumerated, 35 per cent. ad. val. Bars, Block and Pigs free. Banca, subject to duty of 10 per cent.
Banca.................. ₩ ℔ 20c
Straits.................. ₩ ℔ 17
English.................. ₩ ℔ 16

TIN PLATES.
I C 10x14, 12x12, 14x20 } Prime Charcoal..................$6.50 @ 6.75
I X 10x14, 12x12, 14x20 } Prime Charcoal.................. 8.50 @ 8.75
D C 12½x17 " .... 6.00 @ 6.25
D X 12½x17 " .... 8.00 @ 8.25
For each additional X add.................. 2.00

COKE TIN PLATE.

	Best.	2d quality.	Ordinary.
I C 10x14, I C 12x12, I C 14x20	$6.00	5.75	5.50

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20	$5.75	5.50	5.25 @ 5.37½
I X 14x20	@ 7.75	....	....
I C 20x28	11.75@12.00	11.25 @ 11.50	10.25 @ 10.75
I X 20x28	@ 10.00	....	....
I C 20x200	@ 17.50	...	....

I C 14x20 M. F. Brand..................$7.75

SOLDER..................No. 1, 10 @ 11c No. 2, 9 @ 9½c

SPELTER—DUTY: In Pigs, Bars and Plates, $1 ₩ 100 ℔s.
American, cash..................5¼ @ 5½c
Bergen Port from Lehigh Ore.................. 9c
Lehigh, on spot..................10c

ZINC.—DUTY: Pig or Block, 1.50 ₩ 100 ℔s. Sheet, 2½c ₩ ℔.
Sheet, Cask..................6½c
" Open..................7c

Paper Stock, Old Metals, &c

(Dealer's Selling Price.)
Canvas linen..................4 @
White cotton, new..................5½ @
" " No. 2.................. @ 2
White linen rags, No. 1..................4 @
" " No. 2..................2½ @
Seconds..................1½ @ 1¾
Mixed woolens..................2½ @ 3¼
Soft woolens..................8½ @
Gunny bagging..................3⅜ @
Jute Butts..................3 @ 3½
Kentucky bagging..................5 @
Waste paper and scraps.................. @ 1
Rope cuttings..................1½ @ 3
Kentucky bale rope..................4 @ 4½
Grass rope.................. @ 3
Tarred shaking..................2 @
White collar cuttings, all paper..................7 @
" " " muslin lined..................5 @
" " Envelope..................7 @
Hard White Shavings, No. 1..................3½ @
Soft " " No. 1..................3 @
White Shavings, No. 2..................2¾ @
Mixed Shavings, part white..................2¼ @
Imperfections, No. 2, best folded sheets..................3¼ @
" No. 1. Heavy Stock..................3½ @
Book Stock.................. @
" Heavy..................2¾ @
" " Light..................1¾ @
Newspapers..................1¾ @ 2
Prints..................1½ @ 2
Pure Manilas..................2¾ @ 2⅞
Bogus Manilas and Hardwares..................1 @
Commons..................½ @
Binders' Board Cuttings..................1 @ 1¼
Straw Board Cuttings..................¾ @
Woolen Tailor Clips..................13 @ 14
Satinet " ....2 @ 2½

Old Metal.
Copper, heavy..................15 @
Copper Bottoms.................. 13
Yellow Metal..................10 @
Brass, light..................9 @
" heavy..................11 @
Heavy Composition..................13 @
Old Lead, solid.................. @ 3¾
Tea Lead.................. @ 3
Zinc.................. @ 3⅜
Pewter, No 1..................11 @
" No. 2..................9 @
Wrought Iron..................per ton $17.00
Machinery Iron..................per ton 11 00
Light Iron..................per ton 10.00
Stove Plate..................per ton 10.00
Grate Bars..................per ton 4.00

Paints, Oils, &c.

Paints.
Black Lamp, Coach Painters.................. ₩ ℔ 20c
" " Ordinary..................6c
" Ivory Drop, fair..................12 @ 15c
" " best..................23c
Black Paint, in oil..................kegs, 8c asst'd cans, 11c
Blue, Prussian, fair to best..................[illegible]
" " " in oil..................[illegible]
Blue Chinese dry..................83c
" Ultramarine..................18 @ 30c
Brown, Spanish..................1¼c
" Van Dyke..................10@12c
Carmine, 40..................combination price
Green, Chrome..................15 @ 23c
" " in oil..................14 @ 18 @ 25c
" Paris..................good, 25c; best, 30c
" " in oil.................. " 30c; " 45c
Iron Paint, Bright Red.................. ₩ ℔ 2½c
" Red.................. ₩ ℔ 2c
" Brown.................. ₩ ℔ 1½c
" Purple.................. ₩ ℔ 3c
" Ground in Oil, Bright Red.................. ₩ ℔ 5½c
" " " Red.................. ₩ ℔ 5c
" " " Brown.................. ₩ ℔ 4½c
" " " Purple.................. ₩ ℔ 6c
Mineral Paints..................1¼ @ 4c
Orange Mineral..................12c
Red Lead, American..................6c
" " English..................9½c gold
" Venetian (N. C.) dry..................$1.70 @ $1.75
" " in oil..........asst'd cans, 11c; kegs, 8c
" Indian dry..................9 @ 12c
Rose Pink..................10 @ 13c
Sienna, American, Raw..................4c
" Burnt..................4½c
" " in oil..................10 @ 16 @ 20c
" Raw " ....11 @ 15 @ 25c
Umber, Burnt..................4 @ 8c
" " in oil..................9 @ 12 @ 16c
" Raw..................3½ @ 7½c
" " in oil..................10 @ 16 @ 18c
Vermillion, Chinese..................90c, gold
" English..................60c, gold
" Trieste..................1.10, gold
" American, Common..................15c
White Lead, American. pure dry..................7c
" " " in oil..................7½c
White, Paris, English, prime..........in bbls. 2 @ 2½c
Yellow Ochre, French..................$1.75
" " " in oil...asst'd cans, 11c; kegs, 8c
" " Vermont..................in casks 1½c
Yellow Chrome..................17 @ 27c
" " in oil..................14 @ 18 @ 25c
Zinc White, American No. 1, dry..................7c
" " No. 1, in oil..................9c
" French (Paris)..................11c
" " in oil..................10 @ 11c

Oils.
Linseed, Raw, in casks and bbls.......... ₩ gal. 63c & 65c
" Boiled. " " .... " 68 & 70c
Bleached Whale.................. ₩ gal. 51c
" Sperm.................. ₩ gal. 1033
" Elephant..................62c
Signal..................53c
Prime Lard..................67c
No. 1 " 52c
West Virginia..................18c @ 25c
Drilling..................40c
Empire Cylinder..................65c
Miners' Oil..................33 to 40c
Fish Oil, pressed..................32c
Neatsfoot..................70c
Tallow..................58c
Machinery..................40c
Engine..................50c

Sundries.
Asph atum..................08
Benzine.................. ₩ gal, 16c
Chalk..................⅜c
" Block..................⅜c
Dryer, Patent, Am'n..........ass't cans, 10½c; keg, 9c
Frostings..................50c
Glue, White..................33 @ 41c
" Sheet..................20c
Glaziers' Points, Zinc..................20
Gum, Copal..................36c
" Damar..................25c
" Shellac, English..................30c
" " dark..................25c
Litharge, English..................9c gold
Mineral Wool.................. ₩ ℔ 1¼ @ 1½c
Pumice Stone, selected Lumps..................4 @ 6c
" powdered..................2½c
Putty, in bladders..................2½c
" in bulk..................2c
Rotten Stone, soft, English..................8c
Spirits Turpentine..................30c
Whiting Spanish..................¾c

Glass.

FRENCH WINDOW GLASS.
Prices current per box of 50 feet.

Single Thick.—discount 60&5 %

SIZES.	1st.	2d.	3d.	4th
6 x 8 to 10 x 15	$ 7.50	$ 6.75	$ 6.25	$ 5.75
11 x 14 to 16 x 24	8.50	7.75	7.25	6.50
13 x 22 to 20 x 30	10.75	9.75	8.75	7.75
15 x 36 to 24 x 30	12.25	10.75	9.00	
26 x 28 to 24 x 36	13.00	11.50	9.75	
26 x 37 to 26 x 44	14.50	13.25	10.75	
26 x 46 to 30 x 50	15.00	14.00	11.25	
30 x 52 to 30 x 54	16.00	14.50	12.00	
30 x 56 to 34 x 56	17.25	15.50	13.50	
34 x 58 to 34 x 60	18.25	17.25	15.00	
36 x 60 to 40 x 60	20.75	18.75	17.25	

Double Thick.—Discount 60&15 %

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$12.00	$11.00	$10.00	$ 9.?
11 x 14 to 16 x 24	13.75	12.50	11.75	
18 x 22 to 20 x 30	17.25	15.75	14.00	
15 x 36 to 24 x 30	19.75	17.25	14.50	
26 x 28 to 24 x 36	21.00	18.50	15.75	
26 x 36 to 26 x 44	23.25	21.25	17.25	
26 x 46 to 30 x 50	24.00	22.50	18.00	
30 x 52 to 30 x 54	25.75	23.25	19.25	
30 x 56 to 34 x 56	27.75	25.00	21.75	
34 x 58 to 34 x 60	29.25	27.75	24.00	
36 x 60 to 40 x 60	33.25	30.00	27.75	

Sizes above 40 x 60—$10.00 per box extra for every five inches.
An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 50 inches in length, and not making more than 81 united inches, will be charged in the 81 united inches bracket

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R. H. WOLFF & CO.,

IMPORTERS OF

IRON AND STEEL.

Sole Agents for the Sale of the Celebrated

Pr. HOMOGENEOUS DEC.' CAST STEEL, GUN BARRELS, MOULDS AND ORDNANCE.

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Hammers, Anvils, Vises, Blacksmiths' Tools.

WARRANTED CAST STEEL. Specially adapted for Dies, Punches, Turning Tools, Drills, &c.

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Specially adapted for Taps, Reamers, Milling Tools, &c. *Warranted not to crack in hardening Tools of any size.*

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TOOL STEEL.

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Warranted equal to any imported in *quality, finish and accuracy.*

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SANDERSON BROTHERS & COMP'Y'S BEST REFINED CAST STEEL.

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A full assortment of this universally approved OLD BRAND and other Steels for sale by

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Only double Ring ever invented. The only Ring that will effectually keep Hogs from rooting. No sharp points in the nose.

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is the best Husker in the market. Farmers say it is the best. Use no other.

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Only single Ring in the market that closes on the outside of the nose. No sharp points in the nose to keep it sore.

Ringers, 75c. Rings, 40c. 100. Holders, 75c. Huskers, 15c.

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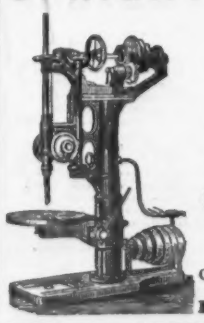

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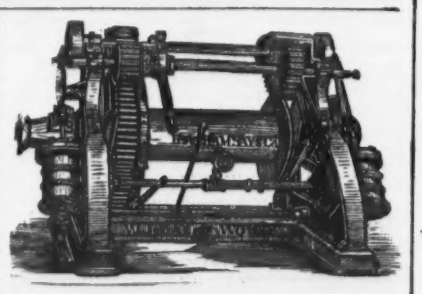

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Manufactured by *H. A. RAMSAY & CO.,*

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THE PATENT LEADER THAWER

Is Now Ready.

The **only** reliable method for thawing out leaders. Price, complete, $10.

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Turns out at least **double work** by increased speed and feed, **and cuts harder metals** than any other Steel. Neither hardening nor tempering required.

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Increases their Durability at least five fold.

Secures absolute safety from cracking.

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The most popular Powder in use.

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Nos. 1 (coarse) to 4 (fine), unequaled in strength, quickness and cleanliness; adapted for Glass Ball and Pigeon Shooting.

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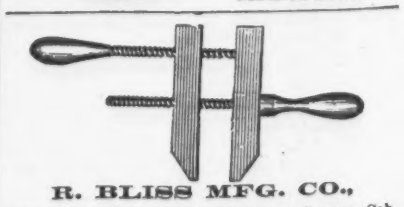

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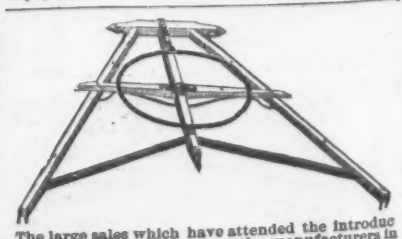

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The members of the Edgar Thomson Steel Company, Limited, have had large experience in manufacturing and in railway management; their works are the most complete in the world, with all the late improvements, and are located in the best Bessemer metal district in the United States, and their managing officers are experienced in the manufacture of Bessemer Steel.

The Company warrants its rails equal in quality to any manufactured in the United States.

Rails of any weight or section furnished on short notice. Orders for trial lots solicited.

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BUTCHERS' KNIVES,
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MERCHANT BAR, FISH PLATES, PIG METAL, IRON RAILS & BESSEMER STEEL RAILS.

CAPACITY OF WORKS.

Fish Plates	20,000 tons
Merchant Bar	40,000 "
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Total Capacity per year	280,000 "

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Gardner's Pocket Knives. Trenton Anvils.

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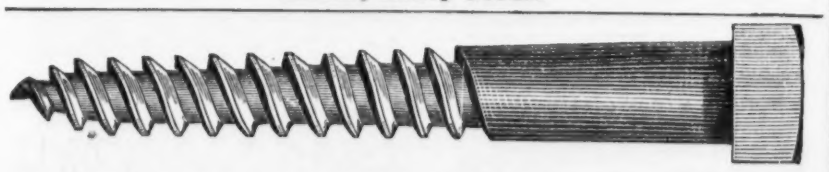
German and English Hardware, Cutlery, Guns, Gun Material, Chains, Heavy Goods.



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MANUFACTURERS OF

COACH SCREWS

(With Gimlet Points),

ALL KINDS OF

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FORGED SET SCREWS,

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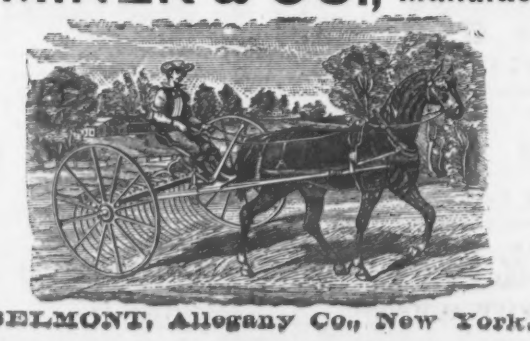

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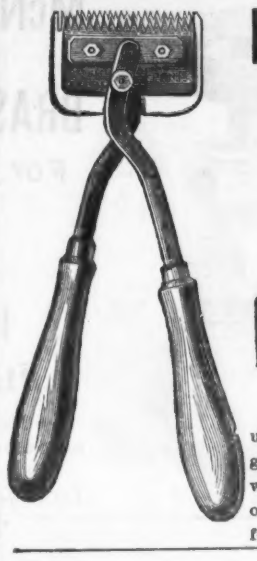
BELMONT, Allegany Co., New York.



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SOLE AGENTS FOR

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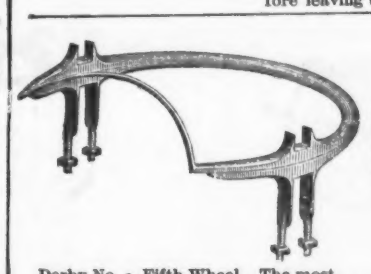
Patent Improved

HORSE CLIPPERS.

The cutting parts are made of the very best English Cast Steel. The upper knife passes over two teeth. There is a protecting plate which gives the Clipper great strength. The iron parts of the handles are all wrought, not malleable, iron, and adjusted so that there is no danger of the handles getting broken. Every Clipper is carefully examined before leaving the factory. Quick and easy working can be guaranteed.



Derby No. 2, Fifth Wheel. The most popular wheel in the market.

New Diamond Step. Forged from Norway iron bars.

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Birmingham, Conn.,

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First-Class Carriage Forgings, Fifth Wheels, Steps, Body Loops, Stay Ends Offsets, Long Joint Ends, &c., &c.

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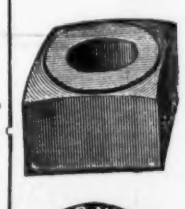

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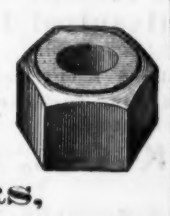

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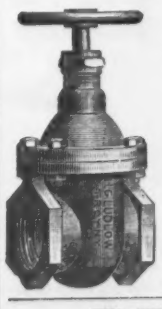
And SOLID SAWS of all kinds. Trenton, N. J.



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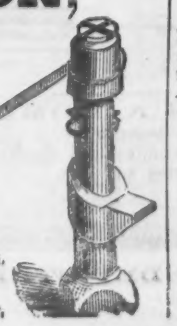

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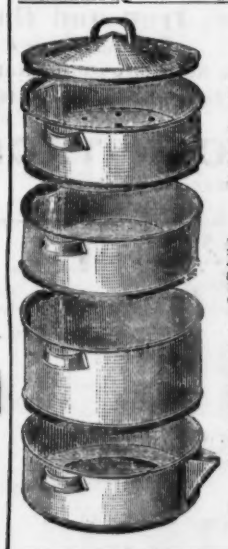

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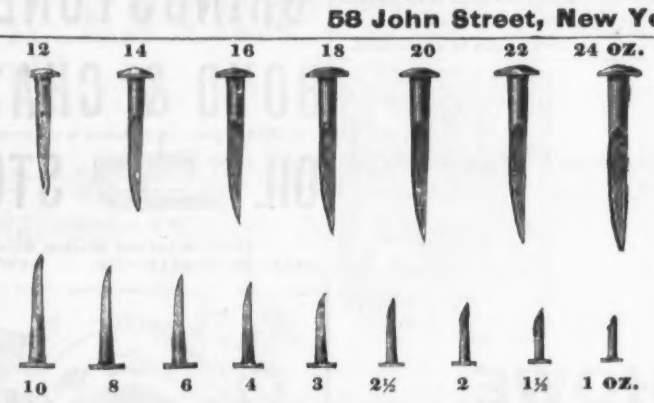

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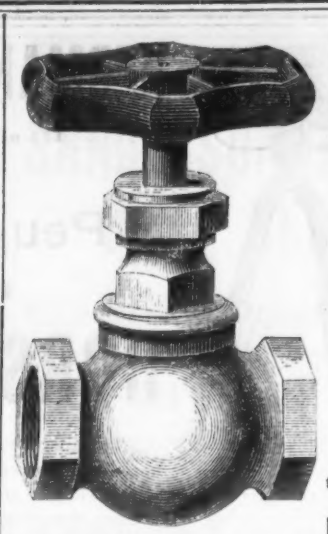

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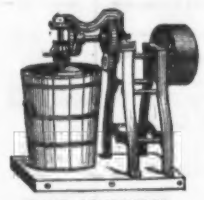

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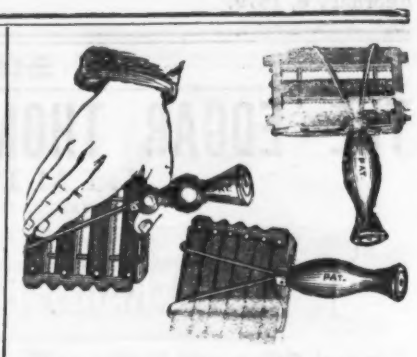

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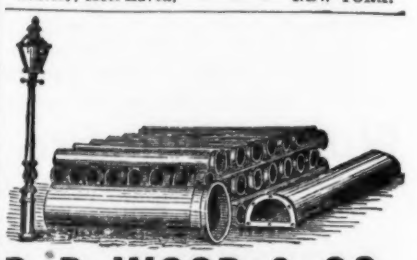

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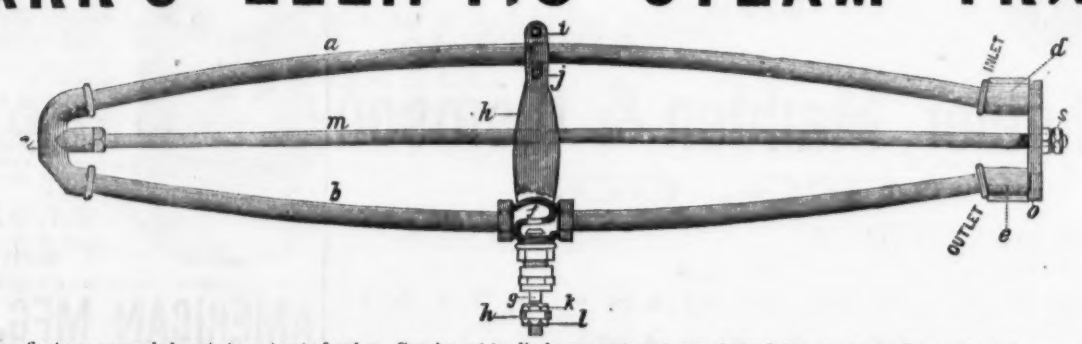

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Made of JESSOP'S BEST CAST STEEL, and warranted superior to any other

Two sizes: Large Size Boring, ¾ to 3 inches; Small Size Boring, ¾ to 1¾ inches.

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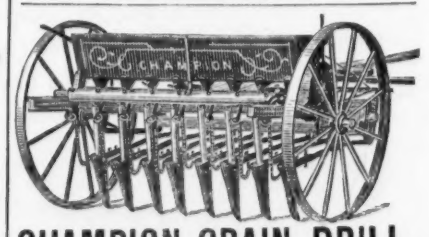

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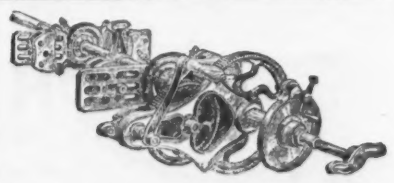

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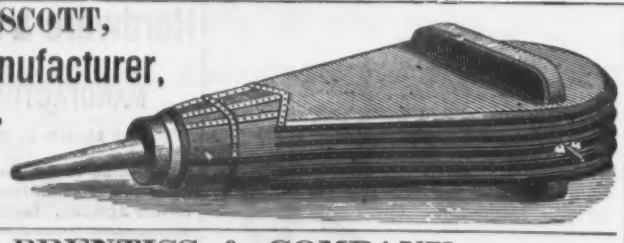

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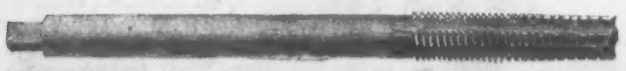

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Bates' Nut Augers.......dis 50 @ 55%
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Galvanized Pump.......℔ lb 10c net
Best Proof Coil Chain—(English).

℔ lb	11½	8¼	7¾	7½	8½	8¼	7c gold
	3-16	¼	5-16	⅜	7-16	½	⅝ in.

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Adjustable Handle.......dis 20%

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Tinned.......dis 50&10 @ 60%

℔ doz.	$3 50	4 00	4 50	5 00	5 50	6 50	7 50	9 00	10 00
No.	0	1	2	3	4	5	6	7	8

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℔ doz.	$3 00	3 75	4 25	4 75	5 25	6 00	7 00	8 00	9 00
No.	0	1	2	3	4	5	6	7	8

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Eagle—3½ in. roll.......Each $1 62½ net
" —5½ in. roll....... " 2 12½ net
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	Nos. 5	6	7	8	9	10
Ausable	30	27	25	24	23	22
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Clinton		22	20	19	18	17
" Polished and Pointed		28	21	20	19	18

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Discount on Ausable and Clinton, 20%; Globe, net.

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No.......	57	58	59	60	61	62	63	
℔ doz.......	$18 00		26 00		33 00			dis 50%
No.......	64		65		66			

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Square Candle and Oil.......℔ doz. $2 75 @ 3 00
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Guards. 50 cents extra per doz. net.

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Landers, Frary & Clark's Petroleum.......dis 20&10%
Brass Liquor Cocks.......dis 50%
Cork Lined " ....dis 65 @ 65&10%

Meat Cutters.—Dixon's.......dis 25 @ 30%
Woodruff.......dis 25 @ 30%
Stowe.......dis 25 @ 30%
Hale's.......new list, dis 50&2%
American.......dis 25%
Stuffers.......dis 25 @ 30%
Enterprise Stuffers.......dis 20%

Planes.—Sandusky.......dis 50%
Ogontz.......dis 60%
Bailey.......dis 25&10%

Plane Irons.—Sandusky.......dis 10&10%
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" Non-Adjustable.......dis 65&10%

Picks.—Philadelphia.......dis 20%
Hunt's.......dis 25%

Pumps.—Bickford.......$7.00, dis 20&10%

Rules—Stanley Boxwood.......dis 70&10%
Stanley Ivory.......dis 60&10%

Steelyards.—Hart's Pattern.......dis 60&10%

℔ doz.....	$14 50	17 75	21 00	26 50	31 00	35 50
Lbs	50	100	150	200	250	300

American Pattern.......dis 25 @ 25&10%

℔ doz.....	$5 50	7 00	9 00	10 00	11 00	12 00
Lbs.......	50	100	150	200	250	300

English Pattern.......dis 25 @ 25%

℔ doz......	$7 00	8 67	10 67	12 67	14 67	16 67
Lbs.......	50	100	150	200	250	300

Squares.—
Steel and Iron.......dis 50%; full case, dis 50&10%
Try Squares, Stanley.......dis 50&10%
Disston's Try Squares.......dis 50&10%

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened.......℔ doz. $.800 net
Clipper No. 10, Bronzed Blade Boxed and Sharpened.......℔ doz. $7 50 net
Clipper No. 5, Painted Red, Boxed and Sharpened.......℔ doz $7 25 net

Saws—Disston's Hand, Panel and Rip.......dis 20%
Disston's Circular.......dis 30%
" Cross-Cut No. 2, Plain Tooth...℔ ft., 45c net
" " Patent Tooth.......℔ ft., 45c. net
" " Champion Tooth....℔ ft., 35c. net

Shovels and Spades.
Rowland.......dis 50&5%
Oliver Ames & Sons, new list.......dis 20%
Not stamped "Ames".......dis 37½%

Sad Irons.—4 to 10 lbs.......℔ lb.. 2¼ @ 2½c
Mrs. Potts' Patent.......dis 30 @ 40%

Stone.—Arkansas Oil Stone.......℔ lb $2 00 net
Washita Extra....... " 36 }
" No. 1....... " 20 }
" " 2....... " 16½ } dis 10%
" Slips....... " 45 }
" Axe....... " 20 }
Turkey Oil Stone No. 1....... " 16½c net
" " " 2....... " 16c net
" Axe Stone....... " 25c net
Hindostan Oil Stone No 1 ....℔ lb 4 @ 4½c net
" Axe Stone....... " 5 @ 5½c net

Screws.
Flat Head Iron.......dis 60%
" " Brass.......dis 45%
Round Head Brass.......dis 45%
" " Iron.......dis 50%

Spoons.—
Plated.......dis 40 @ 40&5%
German Silver.......dis 30&10%
Britannia, Boardman's.......dis 65%
" Parkers.......dis 65%
Tinned.......dis 15 @ 20%
" by case.......dis 20%

Springs—Torrey.......℔ doz $2 00 @ 2 10 net
Philadelphia .....5 in.. $5 00; 8 in.. $7 00 ℔ doz. dis 25%
Chatfield.......No. 1, $3 50; 2, $4 00; 3, $6 00 ℔ doz. net
Gem Coil No. 1, Large Jap'd.......℔ doz $3 50 }
" " No. 2, Medium Jap'd....... " 2 50 } dis
" " No. 3, Small " .... " 2 00 }

Stocks and Dies........dis 10&5%

Stove Polish.—Gem.......℔ gross, $4 50, dis 5%
Dixon....... " $6 00, dis 5%
Onyx....... " $4 00 @ 4 25 net

Tacks, Brads, &c.—New List.......dis 55&10%
Shoe Nails—
4-8 and larger, 9c; 3½-8, 9½c ℔ lb New list, net
Double Pointed Tacks.......dis 40&5%

Traps.
Genuine Oneida—Newhouse.......dis 33⅓%
Im. Oneida—Newhouse list (1st qual.).......dis 60&10%

Vises.—Solid Box, Trenton new list.......dis 55%

Wrenches.—
Girard (Coe's Pattern).......dis 50 @ 10&10%
Agricultural—
℔ doz 10 in., $3 60; 12 in., $5 40 net; case dis 5%
Coes' Genuine.......dis 60&10%
" Pat. Wrot Bar.......dis 60&10%
" " Mall " ....dis 75&10%
Taft's " Wrot " ....dis 75 @ 75&10%
Phila. Tool Co., Duplex.......dis 25%

Wire.—
Bright or Ann'd, No. 19 to 36 ....dis 62½%
" " No. 27 to 36.......dis 67½%
" " No. 0 to 18 ....dis 62½%
Coppered 0 to 18.......dis 55%
Tinned Broom Wire.......dis 55%
Galvanized, No. 7 to 18 ....Market list, dis 30%

Wringers.—Novelty No. 10.......℔ doz. $60 00 net
Novelty No. 2....... " 68 00 net
Universal, No. 2½....... " 60 00 net
" No 2....... " 63 00 net

PITTSBURGH.

Merchant Iron.

Flat Bar.

1¼ to 4x⅜ to 1 in.......1.80c	1¼ and 1⅜x⅜ to ¾ in..1.90c
4¼ to 6x⅜ to 1 in.......1.90c	1 and 1⅛x⅜ to ¾ in... 2c
1¾ to 6x1⅛ to 1½ in...2.20c	⅝, ¾ and ⅞x⅜ to ⅝ in.2.20c

Rounds and Squares.	
1 to 1⅞ in.......1.80c	⅝ to 9-16 in....... 2c
2 to 2⅝ in....... 2c	½ to 7-16 in.......2.20c
2¾ to 3¼ in.......2.30c	⅜ in.......2.40c
3⅜ to 4 in.......2.80c	5-16 in.......2.60c
¾ to ⅞ in.......1.90c	¼ in.......2.80c
	3-16 in.......4.80c

Horse Shoe Bar—all sizes.......2.80c

Heavy Bands.	
3½ to 6x¼ and 5-16 in. 2c	1 to 1⅜x¼ and 5-16...2.10c
1½ to 3¼x¼ & 5-16 in. 2c	¾ to ⅞x¼ and 5-16...2.30c
	⅝ & ½x¼ and 5-16...2.80c

Light Bands.	
3 to 6x⅛ to 3-16 in.......2.10c	1 to 1⅜x⅛ to 3-16.......2.50c
1½ to 2⅞x⅛ to 3-16 in...2.30c	¾ and ⅞x⅛ to 3-16 in..2.80c
	⅝ and ½x⅛ to 3-16 in..3.30c

Same sizes X No. 11 and No. 12 2-10c. extra.

Hoop Iron.	
⅝ & 9-16, Nos. 13 to 16..4.50c	⅝ & 9-16, Nos. 17 to 20..4.80c
¾ & 11-16, Nos. 13 to 16.. 4c	¾ & 11-16, Nos. 17 to 20.4.30c
⅞ & 13-16, Nos. 13 to 16..3.50c	⅞ & 13-16, Nos. 17 to 20.3.80c
1 & 1⅛, Nos. 13 to 15..3.10c	1 and 1⅛, Nos. 16 to 19.3.40c
1¼ to 2, Nos. 13 to 15..2.70c	1¼ to 2, Nos. 16 to 18.2.90c
	2¼ to 3½, Nos. 13 to 15.2.80c

The prices under Hoop Iron do not apply to Cotton Ties.
1-10c ℔ lb extra for each gauge lighter.

Oval Iron.

⅞ to 1¼ in.......2.20c	¾ in.......2.8c
⅝ to ¾ in.......2.40c	⅝ in....... 3c

Half Oval & Half Round	
⅞ to 1¼ in.......2.50c	½ in.......3.30c
⅝ to ¾ in....... 3c	⅜ in.......4.80c
	W'g'n Box Iron, ¾&⅞.3.30c

Sheet Iron. Com'n. Charc'l	Com'n. Charc'l
No. 10 to 14..2.60c 4.10c	No. 22 to 24..3.30c 4.80c
No. 15 to 17..2.80c 4.30c	No. 25 & 26...3.50c 5c
No. 18 to 21..3.10c 4.60c	No. 27.......3.70c 5.20c
	No. 28.......4.10c 5.60c

All Sheets, No. 18 and lighter, over 30 in. wide, not less than 2-10c. extra.

Wood's Patent Planished Sheet.
1st quality (A).......10½c | 2d quality (B).......9½c
Plate Iron—3-16 to ½ in. thick.......2.8c

Galvanized Iron-Juniata.

Nos. 14 to 20.......12c	No. 27.......14c
Nos. 21 to 24.......13c	No. 28.......16c
Nos. 25 and 26.......14c	No. 29.......18c

Common and imperfect Juniata, 45 to 50% off. Discount, 30 to 40%.

Roofing Iron, Corrugated or Crimped.

Galvanized Common.	Black.
No. 20.......6c, net cash	No. 20.......3¾c
No. 21 & 22.......6¾ "	Nos. 21 & 22.......4c

Bridge Iron.

Carnegie Bros. & Co.'s list.
Beams and Channels.
Solid Wrought Iron Beams, 3 to 10½ in. x 30 ft..℔ lb 3¾c
" " " " 12 in. by 25 ft....... " 3¾c
" " " " 15 in. by 25 ft....... " 3¾c
Deck Beams, 7 to 9 in. by 30 ft....... " 3¾c
Channel Bars, 1¾ to 10 in. by 30 ft....... " 2¾c
" " 12 in. by 30 ft....... " 2¾c

Tee Iron.
1 in. x 1 in. to 5 in. x 3 in.......℔ lb 2.8c

Angle Iron.
Equal Sided, 1x1 to 1⅜x1⅜ in.......℔ lb 2.6c
" " 2x2 to 4x4....... " 2.5c
Unequal Sided, 2x1⅜ to 5x4....... " 2.5c
Square Root Angles, 2x2 to 3½x3½....... " 2.5c
Star Iron, 1½x1½ to 4x4....... " 2.6c
Sash Iron, 1¾x⅝x3-16....... " 3.25c
Miscellaneous Shapes, various shapes...℔ lb, 2.6 to 3.5c
Special prices for large lots.

Nails.

Fence and Brads.

10d to 60d.......$2.15	4d and 5d.......$2.90
8d and 9d....... 2.40	3d....... 3.65
6d and 7d....... 2.65	2d....... 4.90

Barrel.

¾ in....... 6.15	1⅛ in....... 3.90
⅞ " 5.15	1¼ " 3.65
1 " 4.65	1⅜ " 3.15
	1½ " 2.90

Lining.
⅞ in....... 6.65 | ¾ in....... 8.15
Tobacco.......50 cents per keg advance on common
Clinch—All sizes.......3.90

Slating.

5d....... 3.15	3d....... 3.90
4d....... 3.15	2d....... 5.15

Finishing.	
1 in....... 7.15	1½ to 1¾ in....... 4.15
1¼ " 6.15	2 in....... 3.90
1½ " 4.40	2½ " 3.65
	3 " and over....... 3.40

Casing and Box.	
10d to 30d....... 2.90	6d....... 3.40
8d....... 3.15	4d....... 3.65
	3d....... 4.65

Fine Blued.	
4d....... 3.90	3d....... 5.15
	2d....... 5.90

Cut Spikes—All sizes.......2.40
Boat Spikes—All sizes.......2.90
Each half keg 10 cents extra.

TERMS.—Note or acceptance at 60 days; or a discount of 2 per cent. for cash, if remitted within 10 days from date of invoice. An abatement of 10 cents per keg allowed upon orders of 200 kegs or over.

Steel.

Square, Flat and Octagon Tool Steel.

⅜ to 2 in.......13c	7-32 and 4⅛ 5 in.......16c
5-16 and 2⅛ to 3 in.......14c	3-16 and 5⅛ to 6 in.......19c
¼ and 3⅛ to 4 in.......15c	5-32 in.......24c

Single and Double Shear Nailers—Same as Tool.
Knife, Tap, Die, Mill Pick, Drill—Ordinary sizes.......13c

Machinery Steel—Round.

⅜ to 2 in.......7½c	7-32 and 4⅛ to 5 in.......10½c
5-16 and 2⅛ to 3 in.......8½c	3-16 and 5⅛ to 6 in.......13½c
¼ and 3⅛ to 4 in.......9½c	5-32 in.......18½c
Cast Spring Steel.	1⅝ to 3x5-32 to 3-16 in...7½c
1 to 4x¼ to ½ in.......6½c	⅞ to 1⅜x5-32 to 3-16 in..8½c

Agricultural Steels.
Solid Cast Steel Plow, 4 to 16 by 3-16 to ⅜ in....... 7c
"Iron Center Plow," 4 to 16x3-16 to ⅜ in....... 8c
"Iron Back Plow," 4 to 16x3-16 to ⅜ in....... 8½c
Soft Steel Center Plow, 4 to 16x3-16 to ⅜ in....... 9c
Landside and Cultivator, C. S., ⅛ in. thick....... 9½c
Circular Plow Coulters, 5-32 to ¼ in. thick.......11c
Reaper and Scythe.......13c
Fork and Hoe.......13c
Horse Rake Teeth, to length....... 7c
Finger Bar....... 8c
Cutter Bars, C. S....... 8½c
" " German Spring Steel....... 8½c
Cornstalk Cutter beveled to length....... 7½c
Planters' Hoe, C. S....... 8c
Hoe, C. S....... 9c
.... 7½c

Sheet Steels.

German, 10 to 16 g....... 8c	Common C'st, 17 to 20 g..10c
" 17 to 20 g.......11c	Best Cast, 10 to 16 g.......13c
Common C'st, 10 to 16 g. 9c	" " 17 to 20 g.......14c

Rolls and Castings.

Furnace, Floor and Straightening Plates.......1¾ @ 2c
Housings and Castings not otherwise specified....2½c
Guide Plates.......3 c
Spindles and coupling boxes.......2 @ 2¼c
Sand Rolls and Pinions, large size.......2½c
" " " small size.......3 c
Pipe Mill Castings.......4 c
Rolling Mill Castings under 50 lbs.......3 c
Spur and Bevel Wheels, large.......3 @ 3¼c
" " " small.......4 @ 4¼c
Pulleys up to 30 inches.......4 c
" over 30 inches.......3¼ @ 3½c
Engine Castings, light.......3¾c
" " heavy.......3¼c

Chilled Rolls.
6 to 7 in. diam., 7 to 20 in. long.......6 c
8 to 15 in. " 8 to 40 in. " ....5 c
15 to 24 in. " 15 to 72 in. " ....4 c
24 to 31 in. " 72 to 108 in. " 4½c

Heavy Hardware.

Bolts, Screws, Nuts, etc.
Lewis, Oliver & Phillips, discount off Standard List.
Carriage & Tire Bolts, ordinary orders 75, & 3% off net
Stove Bolts.......40&5% off net
Elevator Bolts.......30% off net
Machine and Square Head Bolts.......60&10% off net
Coach and Lag Screws.......60&10% off net
Bolt Ends.......60&10% off net
Pat. Hot Pressed Sq. and Hex. Nuts.......8c ℔ lb off net
Washers, all made from new band iron..8c ℔ lb off net
Nuts and Washers in 25 lb boxes, ½c ℔ lb ex. Nuts and Washers in lots less than one keg each size, ½c ℔ lb ex. Nuts and Washers in 5 lb boxes, 1c ℔ lb ex
Strap and T Hinges....... 60&10 % off net
Harrow Teeth.......net
Skein Bolts.......net
Cast Iron Washers.......3¼c ℔ lb net
Fire Shovels and Pokers.......50% off

Wagon Hardware.

Single Trees, Neck Yokes and Double Trees, made from best selected hickory, and ironed complete, in the most approved patterns.
No. 1 Southern Plow Single Tree, Ironed complete, Irons all Wrought.......each, 25c net
No. 2 Western Plow Single Tree, Ironed complete, Irons all Wrought.......each, 35c net
No. 3 Wagon Single Tree, Iron complete, Irons all Wrought, except Malleable Ferrule.......each, 50c net
No. 4 Wagon Single Tree, Ironed complete, Irons all Wrought; Improved End Pieces riveted on; one side acts as a wear iron for wheel to rub against.......each, 50c net
Neck Yoke, Ironed complete, Irons all Wrought except End Ferrules, with Wt. Iron Rings.......each, 60c net
Southern Plow Double Tree, Ironed complete, Irons all Wrought.......each, 50c net
Wagon Box Strap Bolts—
For orders of 100 Set, 45&10% dis.

10 in.	long by	7-16	at Screw End,	℔ set of	8 bolts..	45c
12 in.	"	½	"	"	8 "	55c
10 in.	"	9-16	"	"	8 "	65c
12 in.	"	9-16	"	"	8 "	70c
14 in.	"	9-16	"	"	8 "	80c
10 in.	"	⅝	"	"	8 "	80c
12 in.	"	⅝	"	"	8 "	80c
14 in.	"	⅝	"	"	8 "	90c
16 in.	"	⅝	"	"	8 "	1.00
18 in.	"	⅝	"	"	8 "	1.10
20 in.	"	⅝	"	"	8 "	1.20

5c ℔ set for each additional inch over 14 inches. All lengths made.

Chains, Straight or Twist Link.
Reiter & Morton's List.

5-16.......7c	½.......5¾c
⅜.......6c	9-16.......5¼c
7-16.......6c	⅝.......5c

Net cash, 30 days.

Horse Shoes, Etc.—In 100 keg lots.
Juniata Horse Shoes.......per keg, $3.50
" Mule " .... " 4.50
" "Roadster" pattern....... " 3.75
Steel Toe Calks.......per 7½c lb.
Thistlewood & Co.'s Self-Sharpening Horse Shoes.......per keg, $5.25
Thistlewood & Co.'s Self-Sharpening Snow Shoes....... " 5.50
Toe Calks.......per lb. 8c

White and Red Lead.
White Lead in Oil, Assorted Kegs (all sizes).......6 c
" " 25 lb Tin Pails, 100 lb Cases.......6½c
" " 12½ lb Tin " " ....7 c
Red Lead.......in kegs, 6¼c; in barrels, 6 c
Orange Mineral....... " 8¼c; " 8 c
Litharge....... " 6¼c; " 6 c
Dry White Lead..less than 500 lbs., 6¼c; over 500 lbs. 5¾c
White Lead in Oil in lots of less than 500 lbs., ½c additional.
Terms: Note at sixty days, or if paid within 15 days from date of invoice, a discount of 1½ per cent. will be allowed, but not otherwise.

Window Glass.
Per Box of 50 Feet.—Discount 75%.

Single Strength.

Size.	AA.	A.	B.	C.
6 x 8 to 10 x 15	$7.50	$6.75	$6.25	$5.7
11 x 14 to 16 x 24	8.50	7.75	7.25	6.5
18 x 22 to 20 x 30	10.75	9.75	8.75	7.7
15 x 36 to 24 x 30	12.25	10.75	9.00	
26 x 28 to 24 x 36	13.00	11.50	9.75	
26 x 36 to 26 x 44	14.50	13.25	10.75	
26 x 46 to 30 x 50	15.00	14.00	11.25	
30 x 52 to 30 x 54				
30 x 56 to 34 x 56				
34 x 58 to 34 x 60				
36 x 60 to 40 x 60				
Double Strength.				
6 x 8 to 10 x 15	12.00	11.00	10.00	25
11 x 14 to 16 x 24	13.75	12.50	11.75	10.50
18 x 22 to 20 x 30	17.25	15.75	14.00	
15 x 36 to 24 x 30	19.75	17.25	14.50	
26 x 28 to 24 x 36	21.00	18.50	15.75	
26 x 36 to 26 x 44	23.25	21.25	17.25	
26 x 46 to 30 x 50	24.00	22.50	18.00	
30 x 52 to 30 x 54	25.75	23.25	19.25	
30 x 56 to 34 x 56	27.75	25.00	21.75	
34 x 58 to 34 x 60	29.25	27.75	24.00	
36 x 60 to 40 x 60	33.25	30.00	27.75	

An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length and not making more than 81 united inches, will be charged in the 84 united inches bracket.

CHICAGO.

(The Chicago Stamping Co., 10, 12 & 14 Lake St.)
November 12, 1878.

Tin Plate.—

	14x20, IXX, Ch' Best. 10 50
10x14, IC, Ch'l. Good. $6 25	14x20, IXXX, " " 12 50
10x14, IC, " Best. 6 50	DC, 100 Plate " " 6 50
10x14 IX, " " 8 50	DX. " " 8 50
12x12, IC, " " 6 60	DXX. " " 10 50
12x12, IX, " " 8 50	DXXX. " " 12 50
14x20, IC, " " 6 50	IC, Roofing, " " 6 00
14x20, IX, " " 8 50	IX, " " 8 00

20x28, IC, Charcoal Roofing, Good.......
20x28, IC, " Best....... 12 50
20x28, IX, " 16 50
10x14, IC, Coke Plates....... 6 00
14x20, IC, " 6 00
10x20, IC, " 9 50

Block Tin —
Large Pigs .... 19c | Bars....... 21c
Small....... 20c

Zinc.—Sheet, 500 to 1000 lb. Casks....... 6¼c
Loose Sheets....... 6¾c
Slab Zinc or Spelter....... 6 c

Copper.—Bottoms....... 25c
Sheathing....... 23c
Planished....... 38c
" Boiler lengths 35c
Ingot....... 19c
Bolt 24c

Braziers' Sheets.—
30x60, 6 to 7 lbs.......℔ lb 30c | 30x60, 10 to 12 lbs...℔ lb 26c
30x60, 8 to 9 lbs....... " 28c | 30x60, 15 to 100 lbs. " 24c

Solder.—F. S. & Co.'s make
Best Fine....... 14c
No. 1....... 13c
Roofing....... 11¾c
Braziers or Spelter Solder.......23 @ 25c

Antimony....... 16c

Babbit Metal—F. S. & Co.'s....... 12c
No. 2....... 10c

Sheet Iron.—

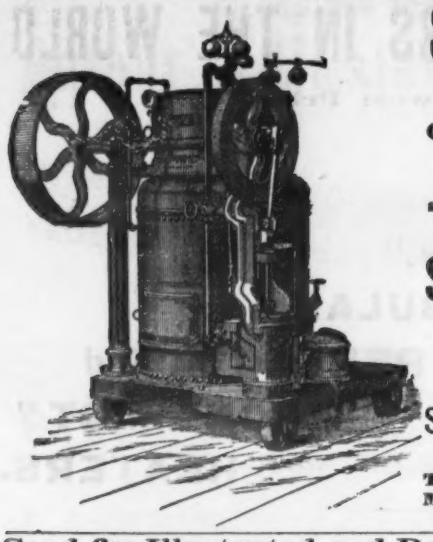
	Common.	Smooth. Com.	Smooth Charcoal.	Smooth Juniata
No. 24.......	3 10c	3 90c	5¾c	7 c
25 & 26...	3 30c	4 10c	6 c	7¼c
27.......	3 50c	4 30c	6¼c	7½c

Galvanized Iron.—dis 45%

No. 16 to 20.......12c	No. 27....... 15c
21 to 24.......13c	28....... 16c
25 & 26.......14c	

Russia Iron.—	No. 1 Stained.......13½c
Perfect....... 14c	In Sheets, 1c. higher.
American Russia.—	B.......9½c
A.......10½c	in sheets, 1c higher
Lead.—	Lead Pipe, in full coils 5
Pig.......5 c	Lead Pipe, when cut.. 5½
Bar....... 6 c	Sheet Lead....... 6

Wire—Bright.......dis 50%
Coppered ....dis 45%



SHAPLEY ENGINE.

Patented - - - Feb. 10, 1874.
Reissued June 22, 1875.

Compact, Practical, Durable and Economical.

Acknowledged to be the best in use. This boiler stands unrivaled.

MANUFACTURED BY

SHAPLEY & WELLS,

Binghamton Iron Works,
Binghamton, N. Y.

MANUFACTURERS OF

Stationary Engines and Boilers.

Also **Machinery for Mills** of all kinds and **Tanneries.** Also their celebrated **Bark Mills,** acknowledged to be the best.
Send for reduced price list circular.

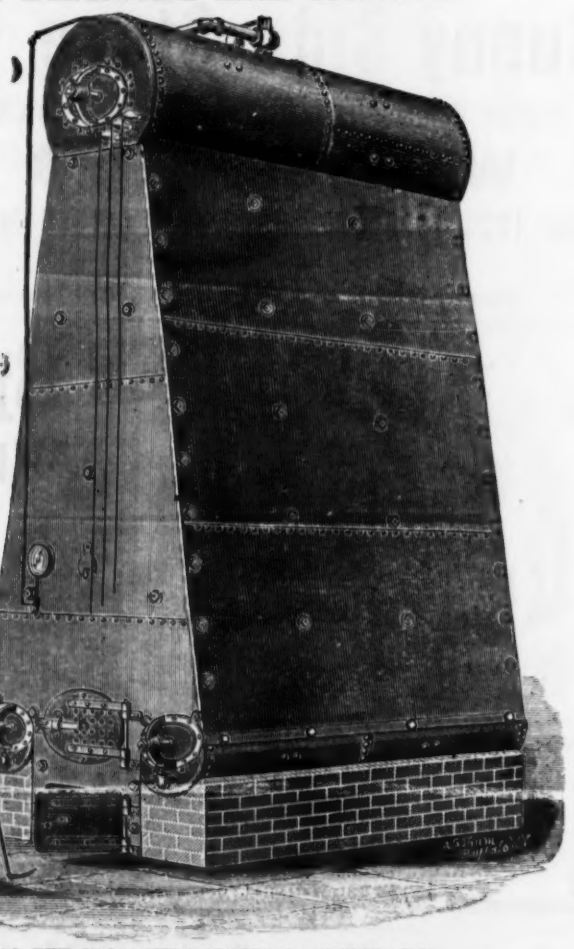
Send for Illustrated and Descriptive Circular of the

FIRMENICH PATENT

SAFETY STEAM BOILER.

The Boiler that made the Best, Dryest, Hottest and Greatest Quantity of Steam per pound of coal at the Centennial Exhibition, and received the Highest Award therefor,

A DIPLOMA AND MEDAL.



AND HAS THE FOLLOWING SUPERIOR ADVANTAGES:

No cleaning of flues, no hard firing caused thereby, and no corrosion caused by the accumulation of soot. Safety from disastrous explosion. The Utmost Durability. Economy, being the most economical boiler in the world. No foaming or priming; entirely dry steam.

J. G. & F. FIRMENICH,

OFFICE,
No. 13 Mortimer Street. - - BUFFALO, N. Y.

LIGHTNING HAY KNIVES,

WEYMOUTH'S PATENT.

This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marches.

The blade is best cast steel, spring temper, easily sharpened, and is giving *universal* satisfaction A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and *seems destined* to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each, of 50 lbs. weight, suitable for shipping by land or water to any part of the world.

Manufactured only by

Hiram Holt & Co.,

East Wilton, Franklin Co., Maine.

For sale by the Hardware Trade generally.

SHIPLEY & BIRGE MFG. CO., Agents at St. Louis.

L. M. RUMSEY & CO.

MANUFACTURERS & JOBBERS OF

PUMPS & FIRE ENGINES,

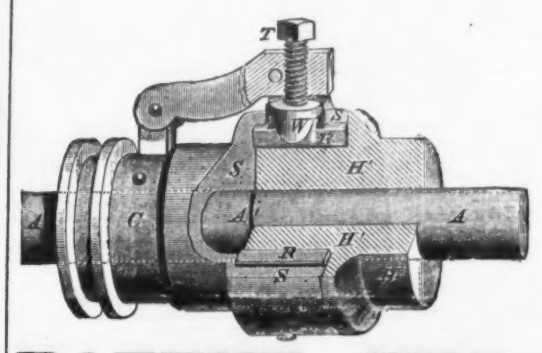
LEAD PIPE & SHEET LEAD, GAS PIPE & FITTINGS

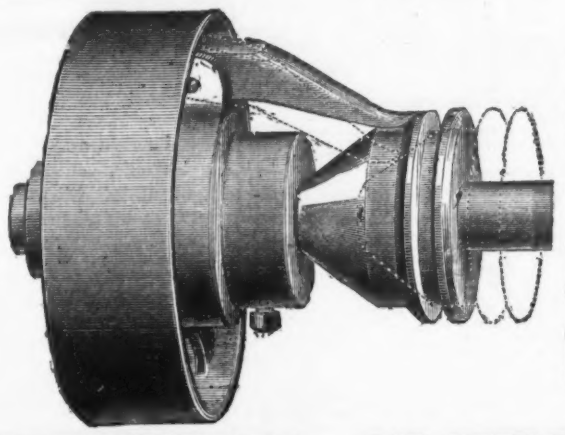
RAILWAY SUPPLIES,

PLUMBERS & STEAM FITTERS BRASS GOODS, BELTING, HOSE, PACKING &c.

NO. 811 N. MAIN STREET, ST. LOUIS, MO.

PATENT
Expanding, Self-Draining
RUBBER BUCKET.
Manufactured only by
L. M. RUMSEY & CO.





HUB FRICTION CLUTCH.

James Smith & Co., Mfg. Agents

PATENT HUB FRICTION CLUTCH.

Manufactured by the **HUB FRICTION CLUTCH CO., Limited, Philadelphia.**

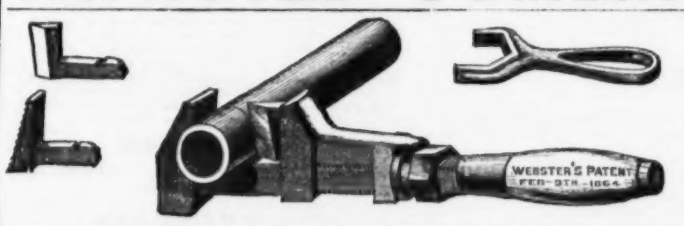
We claim for this device the following advantages for a perfect clutch, it having been adopted by several of the leading manufacturers of machinery and machinists' tools: It works easily but effectively. It works instantly and without noise. It is very durable, and is extremely simple and cheap, and has proven itself to be the best clutch in the market. Special arrangements can be made with leading manufacturers for the adoption of this clutch for their own tools. This clutch can and will be sold for less money than any other clutch in the market.

For sale by GEO. V. CRESSON, Philadelphia; MORTON, REED & Co., Baltimore.

JAMES SMITH & CO., Mfg. Agents, 137 Market Street, Philadelphia.

H. S. MANNING & CO., NEW YORK AGENTS, 111 Liberty Street.

IMPROVED COMBINATION WRENCH.



This WRENCH combines in one Tool

THE BEST SCREW WRENCH

and PIPE CUTTER and PIPE TONGS.

Adopted by Railroad, Gas & Water Companies eveywhere, also by Machinists, Plumbers & Gas Fitters.

H. A. ROGERS, Sole Manufacturer, 19 John St., New York.

Price as low as any other first-class tool. Send for circular.

Eddy Valves.

FIRE HYDRANTS.

Yard Hydrants, Street Washers.

DODGE HAY PRESS.

"DRAW-UP" PRESSES,
For Domestic use, Drugs, &c.

LARD & TALLOW PRESSES.
See *The Iron Age* of July 4, 1878.

Axe, Hatchet, Powder and Brush Machinery.

IRON AND BRASS CASTINGS.
Pulleys and Shafting.

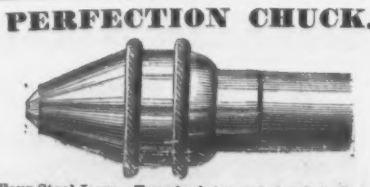
MOHAWK & HUDSON MFG. CO., Waterford, N. Y. (four miles from Troy).

To Mfrs. of Agricultural Implements.

The entire right of Fork shown in cut. Territorial, shop and royalty rights on most favorable terms. The Fork can be made cheaper. In simplicity, durability and work cannot be excelled.

For descriptive circular, terms, &c., address patentee,
WM. ZIMMERMAN,
114 Dearborn St., Chicago, Ill.

PERFECTION CHUCK.

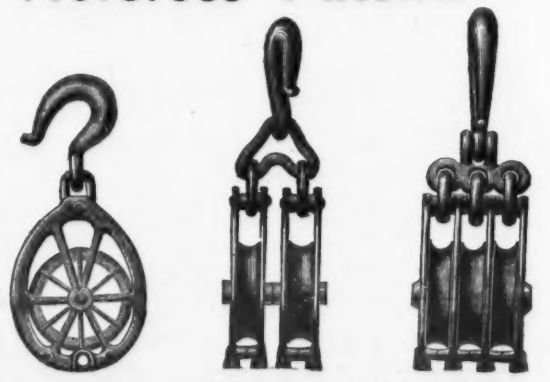


Four Steel Jaws. Four inch turned shank to fit any lathe. It will take from smallest drill to a full 2-16. Warranted fully. Price $1.50. Discount to trade. Pin Vises an same principle and at same price.

JAMES D. FOOT,
No. 40 Broadway, New York.

NEW IRON TACKLE BLOCKS.

Norcross Patent.



Galvanized Malleable Iron Shell and Sheave, Steel Hooks, Steel Pins.

Superior to Wood Blocks on account of not Checking and Cracking.

The Strongest, Lightest, Easiest Running and most Durable Block yet produced.

Send for sample and price list of same to

Providence Tool Co.,

PROVIDENCE, R. I.

HENRY B. NEWHALL 11 WARREN ST. NEW YORK AGENT

Or to **J. H. Work, 13 Pearl St., Boston, Mass.; S. H. & E. Y. Moore, 68 Lake St., Chicago, Ill.; Henry B. Newhall, 11 Warren St., N. Y.**

HUNDLEY & HANKS,

PROPRIETORS OF

NORTH CAROLINA HANDLE CO.

MANUFACTURERS OF

Handles and Spokes,

79 Reade Street and 97 Chambers Street, - - - NEW YORK.

HARDWARE COMMISSION MERCHANTS.

BOSTON.

Reported by Macomber, Bigelow & Dowse, 156 to 164 Oliver St.

Anvils.—"Eagle American" ₩ ℔ 9c. dis 20 %
Apple Parers.—Reading ₩ doz $4.50
Lightning ₩ doz 6.50
Reading "98" ₩ doz 7.50
Aiken's Tools dis 40&10 %
Anvil & Vise.—
No. 1, $4.50; 2, 3.75; 3, 3.00 each dis 25 %
Augurs & Bitts.—Snell's Auger dis 50 %
L'Hommedieu's Ship Augers dis 15 %
Jenning's Bitts dis 10& 10 %
Cook's Bitts dis 50 %
Shepardson's Double-Cut Bitts dis 45 %
" " Gimlets dis 45 %
Stearn's Extension Hollow Augers per doz $36.00
Bonney's " " " per doz 33.00
Axes.—Blue Jackets per doz 8.00
Red Cross per doz 7.50
" Handled per doz 9.50
Dowse " Boys' dis 15 %
Ax Handles.—
Oak Extra, 31 in., No. A ₩ doz $2.25
" 34 in., No. A ₩ doz 2.50
" 31 in., No. B ₩ doz 1.75
" 34 in., No. B ₩ doz 2.00
" 31 or 34 in., No. C ₩ doz 1.25
Axle Clips dis 60 %
Balances.—Chatillon's dis 25&10 %
Barn Door Rail.—
Cast Angle (for Anti-Friction Hangers) per ft. 30
" Half-Round per ft, ⅜, 2½c; ⅞, 4½c
Wrought " per ft, ⅜, 3½c; ⅝, 4c; ¾, 5c
Bells.—Connel's Crank Gong dis 50&10 %
Bird Cages.
Japanned M. B. & D., reduced list, 1878 dis 25 %
Brass " " 1876 dis 25 %
Blind Fasts.—Lock Fasts ₩ C sets $4.00
No. 6 Fasts ₩ C sets 4.00
Veazie Fasts ₩ C sets 7.00
Shedd's ₩ C sets 8.00
Blind Hinges.—Mall. Hook, 3 holes ₩ C sets 5.00
Brad Awl Handles.—
Phœnix Adjustable ₩ doz $2.00
Bolts.—Norway Iron Carriage dis 70&10 %
Common " dis 75&10 %
Borax.—Refined ₩ ℔ 100
Boring Machines.—Snell Upright each, $3.25
Snell Angle each, 4.00
" Augers ₩ set 1.75
Braces.—Barber's dis 40& 5 %
Spofford's dis 50 %
Backus' dis 60 %
Bracket Saws.—Roger's each $2.25
Bracket Saws, extra quality, to No. 5 ₩ gro $0.85
Steel Frame, with patterns ₩ doz 7.50
Lester dis 25 %
"Holly," all iron each, $2.25
Brackets.
H. B. & M. Flower Pot dis 50&10 %
Bronzed Shelf, M. B. & D. list dis 10&10 %
Bread Kneader.—Stanyan dis 25 %
No. 4 capacity 3 loaves ₩ doz $24.00
No. 5 " 5 " ₩ doz 27.00
No. 6 " 8 " ₩ doz 33.00
Bronze Hardware.—Norwalk Lock Co. dis 50&10%
Butts.—Union Fast Joint dis 50& 10 %
" Loose " dis 75&5 %
" Japanned Acorn dis 75&5 %
" Silvered " dis 75&5 %
" Boston Finish dis 75&10 %
Centennial Spring dis 25 %
Carriage Jacks.—Climax ₩ doz $15.00
" large size ₩ doz 18.00
Cartridges.—U. S. Cartridge Co. dis 60 %
Cards.—Sargent Horse and Curry dis 33⅓&10 %
" Cotton dis 25&10 %
" Wool dis 25&10 %
Casters.—Bed and Table dis 50&10 %
Chain.—Traces 6½, 10, 4, straight ₩ pair 45c
" 6½, 10, 4, twisted ₩ pair 50c
" 7, 12, 2, " ₩ pair 75c
Coil 3-16 ₩ ℔ 10c
" ¼ ₩ ℔ 8c
" 5-16 ₩ ℔ 7c
" ⅜ ₩ ℔ 6c
" 7-16 ₩ ℔ 5¾c
" ½ ₩ ℔ 5½c
Chalk.—White, Carpenter's ₩ gross 55c
Red, Carpenter's ₩ gross 75c
Blue, " ₩ gross 90c
Chisels.—Hart, Bliven & Mead, Framing dis 70 %
Underhill, Framing dis 25 %
Buck's Shank, Framing dis 25 %
Clothes Line.—
Galvanized Wire, 100 feet each ₩ doz $4.50
Coal Hods.—Ironclad.—Galvanized dis 25 %
Japanned dis 30 %
Copper Rivets. dis 25 %
Cocks.—Brass, L. F. & C dis 50 %
Cordage.—Manila, usual trade dis ₩ ℔ 12c
Jute ₩ ℔ 9c
Cow Ties. dis 45 %
No. 30, 3 ft. No. 6 Wire, with toggle ₩ doz $5.50
No. 35, 3 ft. " " with snap ₩ doz 5.80
No. 40, 3½ ft. " " with toggle ₩ doz 5.90
No. 45, 3½ ft. " " with snap ₩ doz 4.10
No. 50, 4 ft. No. 4 " with toggle ₩ doz 4.50
No. 55, 4 ft. " " with snap ₩ doz 4.75
No. 60, 4½ ft. " 3 " with toggle ₩ doz 5.38
No. 65, 4½ ft. " " with snap ₩ doz 5.62
Crow-Bars, Cast Steel ₩ ℔ 8c
Iron, Steel Pointed ₩ ℔ 5c
Cutlery.—Pocket, American Shear Co.'s dis 33⅓&10
Butcher Knives, "Woods," Lap Bolster, Square Handle dis 33⅓ %
Steak Knives dis 20 %
Lap Bolster, Oval Handle dis 25 %
Sticking dis 33⅓ %
Skinning dis 33⅓ %
Butcher, Common Round Handle, "Woods" dis 25 %
Shoe Knives, "Woods" dis 10 %
Dividers.—Cook's dis 25 %
Dog Collars dis 20 %
Dog Muzzles.—Automatic dis 15 %
Door Springs.—Torrey's Rod ₩ doz $9.00
Gem Coil dis 10 %
Eccentric Steel Coil Spring, No. 1 ₩ doz $2.75
Door Stops.—"Thurston's" dis 50 %
Drawer Knobs.—"Thurston's" dis 50 %
Drills.—Morse Bitt Stock dis 25 %
Morse Straight Shank dis 20 %
Emery.—Wellington Mills ₩ ℔ 10c
Alden's ₩ ℔ 6c
Enamelled Ware.
Standard Mfg. Co. Kettles dis 50 %
" Sauce Pans dis 35 %
Felloe Plates.—Wrought ₩ ℔ 8c
Files.—Madden & Cockayne dis 50 %
American File Co. dis 40 %
Nicholson " dis 35 %
Fluting Machines.
Knox, with 6 inch rolls ₩ doz $36.00
Geneva ₩ doz 13.50
Rochester ₩ doz 12.00
Forks.
W. C. & Co., Manure, reduced list dis 15&10 %
Gimlet Bitts.
Genuine German, No. 125, 1-32 to 8-32, $1.00; 10-32, $1.10; 12-32, $1.20 ₩ doz gold.
Glass Cutters.
Combination Class Cutter and Knife Sharpener ₩ doz $1.25
Grub Hoes.—K. P. & Co.'s No. 2 ₩ doz 7.50
Hammers.—Maydole's dis 15 %
Hammond's dis 20 %
Dowse's Steel, A. E. ₩ doz $4.00
M. B. & D. dis 25 %
Hangers & Rollers.—Anti-Friction dis 60 %
Climax dis 50 %
Novelty dis 40 %
Common dis 50 %
Hand Screws dis 20 %
Hatchets.—Dis. 15 %
C. F. Dowse, Combination per doz., $10.00
Underhill dis 25 %
Hay Knives.—Lightning ₩ doz $18.00
Hinges.—Strap and T (new list) dis 60&10 %
Providence Plate ₩ ℔ 4c
Wrought Screw Hook ₩ ℔ 4c
Hoes.—W. C. & Co.'s (reduced list) dis 15&10 %
Hooks and Staples.—Brewers' dis 50 %
Horse Nails. No. 6 7 8 9
National Finished .23 .21 .20 .19 dis 15 %
Putnam Pointed .25 .21 .20 .19 net
Horse Nails.—Bridgewater dis 25 %
No. 6, 23; No. 7, 21, No. 8, 20; No. 9, 19.
Knobs.—"Norwalk."
Mineral ₩ doz $0.75
Porcelain, Japanned Mtg ₩ doz .85
" Por. Rose Nickel Mtg ₩ doz 2.50
" Plated " ₩ doz 2.50
Silver Glass ₩ doz 8.00
" Bell Pulls ₩ doz 6.00
Lanterns.—Tubulars, No. 0 ₩ doz 10.00
Railroad, Oil, No. 43 ₩ doz 8.00
Guarded, Oil and Candle, No. 25 ₩ doz 3.50
Triangular ₩ doz 3.00
Hurricane dis 20 %
Lead.—Sheet ₩ ℔ 5½c
Pipe ₩ ℔ 4½c
Locks.—Norwalk Lock Co. (reduced list) dis 50&10 %
Eagle Cabinet dis 25 %
" Trunk dis 25 %
W. Wilcox & Co., Padlocks dis 33⅓&5 %
American Lock Co.'s Steel Key dis 33⅓ %
Metallic Sleeves.—Mann's Patent dis 33⅓ %
Manure Forks.—W. C. & Co. (r'duc'd list) dis 15&10 %
Mattocks.—K. P. & Co., Long Cutter ₩ doz $9.50
K. P. & Co., Short Cutter ₩ doz 9.00
" Pick " ₩ doz 9.50
Measuring Tapes.—Eddy's dis 20 %
Meat Cutters.—Miles' Challenge dis 30 %
Hale's dis 50 %
American dis 25 %
Money Drawers.—Tucker's Alarm ₩ doz $27.00
Mouse Traps.—Delusion ₩ doz 2.00
Oilers.—Zinc and Tin dis 50 %
Brass and Copper dis 50 %
Ox Bows.—Extra finished and varnished dis 10 %
1¼ in., ₩ doz. pair, $5.75 | 2 in., ₩ doz. pair $9.00
1½ in., " " 8.00 | 2½ " " 11.00
Padlocks.—W. Wilcox & Co.'s dis 33⅓&5 %
Miller's Brass ₩ doz $9.00
Picks.—K. P. & Co., Adze Eye, 5 to 6 ℔ ₩ doz 6.50
6 to 7 ℔ ₩ doz 7.00
Planes.—Auburn Tool Co. dis 35 %
N. Y. Tool Co. dis 50 %
English Iron dis 30 %
Bailey's dis 20&10 %
Plated Ware.—Rogers & Bro. dis 40&5 %
Pliers.—Vom Cleff & Co.'s Gold lis %
Button's Wire Pliers dis 33⅓ %
Plumb & Levels.—Stanley, H. & L. Co. dis 60&10 %
Pocket Knives.
American Shear Co.'s dis 33⅓&10 %
Potato Diggers.
W. C. & Co. reduced list dis 13&10
Pulley Blocks dis 33⅓
Pumps.—Union Manufacturing Co.
Iron Cistern dis 55
" Pitcher Spout dis
Copper dis
Rivets.—Black 60
Carriage in 10 ℔ papers dis 40
Copper dis 25
Razor Strops.—Torrey's Full line.
Rules.—Stanley Boxwood, 5 60&10 %
" Ivory, dis 50&10 %
Sadirons.—Common ₩ ℔ 2½c
Laundry ₩ ℔ 5c
Tailor's Geese ₩ ℔ 5c
Enterprise, "Potts" dis 33⅓ %
Mrs. Potts' Large Polishing, Nickeled ₩ doz net $6.50
Sash Locks.—King & Hutchinson's, new list dis 40 %
Hopkins & Dickinson's dis 40 %
Sandpaper.—Baeder & Adamson dis 15 %
M. B. & D. dis 20 %
Sash Weights.—Patent Eye ₩ ℔ 1½c
Saws.—Hand Saws, Disston's dis 20 %
Wheeler & Clemson dis 20&5 %
Cross-Cut Saws.
W. M. & C., Common Tooth, No. 1 ₩ foot 35c
" " Champion " ₩ foot 35c
Disston's, Common " ₩ foot 44c
" Gt. American " ₩ foot 44c
Boynton's Lightning " ₩ foot 45c
Saw Setts.—Spring Lever ₩ doz $10.00
Saw Blades.—Disston dis 20 %
W. M. & C. dis 20&5 %
Welch & Griffith, Extra ₩ doz $9.60
" " No. 2 ₩ doz 8.00
Scales.—Fairbanks dis 25 %
Howe dis 25 %
Screws.—Aiken's Flat-Head Iron dis 60 %
American Flat-Head Iron dis 60 %
" " Brass dis 45 %
" Round-Head " dis 30 %
" " Iron dis 45 %
Grilley " Nickel-plated Piano dis 55&5 %
" " Common dis 50 %
Shaves.—Kimball's ₩ inch 7½c
Watrous dis 15 %
Shears.—American Shear Co. dis 75 %
Shot.—Tatham's ₩ ℔ 6c
Shovels.—O. Ames dis 32½ %
O. Ames, other brands dis 37½ %
M. B. & D. dis 37½ %
Oxford, Birmingham Pattern dis 45 %
Snow Shovels.—Malleable tips ₩ doz $4.00
Skates.—Union dis 25 %
Acme dis 20 %
Spoons.—Tinned Iron dis 15 %
Britannia dis 50 %
Rogers' A No. 1 dis 40&5 %
Stock and Dies.—King's dis 10&5
Tacks.—A. Field & Son's dis 50&10 %
Pittsfield dis 50&10 %
Traps.—Oneida, Genuine dis 33⅓ %
Oneida, Imitation, H. & N. dis 50&10 %
Blake's dis 50&10 %
Tree Scrapers.—No. 1 ₩ doz. $2.0
No. 2 ₩ doz 3.0
No. 3 ₩ doz 4.0
Vises.—Solid Box, Blacksmith's ₩ ℔ 10½c
Simpson's Adjustable dis 25&10 %
Howard Vise Co. dis 33⅓ %
P. L. & Co., Solid Blacksmiths', new list dis 10 %
Weather Strips.
Browne's Flexible Rubber dis 30 %
In 20 feet boxes; No. 1, ⅜ in. wide, ₩ yard, 10c.; No. 2, ⅝ in., 15c.; No. 3, ¾ in., 20c.; No. 4, 1 in., 25c.
Valentine's Felt Moulding dis 30 %
Black Walnut Spring Weather Strips ₩ doz. $3.00
Window Awning.
Dearborns' per window; $1.00, dis 25 %
Window Springs. dis 10 %
Babcock's No. 3 ₩ gross $6.25
" " 4 ₩ gross 4.50
Wire Goods.—Gate Hooks and Eyes, &c. dis 70&10 %
Wrenches.—A. G. Coe's dis 60
Girard Mfg. Co. dis 60&10
Wringers.—Universal, No. 2 ₩ doz $63.0
Universal, No. 2½ ₩ doz 0.0
Novelty, No. 10 ₩ doz
" No. 2 ₩ doz 63.00
" No. 22 ₩ doz 67.00
Excelsior, No. A ₩ doz 78.00
" No. B ₩ doz 60.00
" No. CC ₩ doz 108.00
Novelty Set Tub, E. ₩ doz 60.00
Eureka ₩ doz 54.00
Zinc ₩ ℔
Withington, Cooley & Co.—Hoes, Rakes, Forks, &c. dis 40 %. Special rate for Export.

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sellew & Co.)

Tin Plate.

IC, 10x14, Best Char.	$ 6.50	DX, 13½x17, B. Char.	$ 8.50
IX, 10x14, " "	9.50	DX, 13½x17 " "	11.50
IC, 12x12, " "	6.50	DXXX, 13½x17 " "	14.50
IX, 12x12, " "	8.50	IC, 20x28, " "	11.00
IC, 14x20, " "	6.50	IX, 20x28, " "	13.00
IX, 14x20, " "	8.50	IXX, 20x28, " "	15.00
IXX, 14x20, " "	10.50	IC, 14x20, Best Roof	6.00
IXXX, 14x20, B. Char.	12.50	IX, 14x20, "	8.00
IXXXX, 14x20, " "	14.50	IC, 20x28, " "	12.50
IC, 12x24, " "	6.75	IX, 20x28, " "	16.50
IC, 14x14 " "	13.50	IC, 10x14, Best Coke	5.75
IX, 14x14, " "	16.00	IC 14x20, " "	5.75
IXX, 14x14, " "	18.50	IC, 10x20, " "	9.00
DC, 12½x17, " "	6.50		

Sheet Iron.	Com'n.	S L U D. Ref'd Sm'th.	Ref'd Sm'th.	Juni'a Sm'th
No. 16 to 20	3.00	3.85	3.90	4.00
No. 22 to 24	3.00	3.85	3.85	4.00
No. 26	3.10c	3.90	4.00	4.20
No. 27	3.20c	4.00	4.20	4.40

Genuine Russia Iron.
Perfect—No. 9, 10, 11, 12 per lb. 12½c
No. 1 Stained—No. 9, 10, 11, 12 per lb. 12½c
Tare 25 lbs. to Bdle. For less than Bdle. add 1c. ₩ ℔.
Patent Planished Iron
No. 24 to 27, A quality per lb. 10½c
" " B " " 9½c
For less than Bdle. add 1c. per lb.
Galvanized Sheet Iron.
Juniata, or 1st quality, Discount for full bundles 45 %
Block Tin

Banca, Large Pigs	31c	do. Small	18
Straits, Large Pigs	17c	Bar	19c
Eng. Ref'd, Large Pig	17c		

Solder.

Extra in Bars	12c	No. 2, in Bars	9½c
No. 1, in "	10c	Spelter Solder	21c
Pig Lead—Pigs	4c	In Bars	5c

Antimony 14c
Bismuth $1 10
Nickel 2 00
Crucibles.—Dixon's ₩ No. 4½c

Babbit Metal.

No. 1	₩ ℔. 16c	No. 3	₩ ℔ 11 c
" 2	" 14c	" 4	" 7½c

Copper.
Brazier's, 30x60, 14 to 100 lbs. Sheets 26c
" " 10, 11 & 12 lbs., " " 28c
" " 8 and 9 lbs. " " 30c
" " 6 and 7 lbs. " " 33c
Tinned, 14x48, 14 and 16 oz. 24c
Planished, 14x48, 14 and 16 oz. 28c
" Boiler Sizes, 14 and 16 oz. 35c
Gutter Copper, 20 and 24x72, 10, 11 and 12 ℔. Sheets 28c
" 14 ℔. Sheets 26c
Reservoir Copper, 16x60 and 18x60 26c
Bar Copper, Square and Round, ½ to 1¼ inch 26c
" " " ⅝ inch 29c
Copper Bottoms 2 c
Soldering Coppers 26c

Brass.
Roll, No. 10 to 28, 12 in. in width 25c
" 30, 12 in. in width 26c
" 32, 16 " 33c
" 34, 16 " 38c
" 36, 16 " 41c
Platers, No. 40, 6 4

Brass and Copper Wire.

	Brass.	Copper.		Brass.	Copper.
No. 0 to 20	28c	34c	No. 24	35c	42c
" 21	31c	41c	" 25	38c	49c
" 22	32c	44c	" 26	40c	50c
" 23	33c	48c	" 27	42c	53c

Brass Spring Wire, 2c. ₩ ℔ advance.

Brass Tubing.
Plain ¼ to 3 inch 28c | 5-16 inch 32c
⅜ inch 30c | ¼ " 65c

Copper Rivets and Burs dis 25 %
Brass Kettles 8 to 13 inches ₩ ℔ 35c.
" all sizes over 13 inches " 40c.
Sheet Zinc.—600 lbs. cask " 5½c
250 lbs. cask " 6c
Sheet " 8½c
Wire.—Iron, Bright Market dis 50
Iron, Coppered Market dis 50
Fence, Nos. 7, 8 and 9 dis 45
Trellis, Nos. 10 and 11 ₩ ℔ 4
" No. 14 " 4½c
Hay Baling, Charcoal, No. 10 and 11 " 5
" " No. 12 " 5½c
Broom, Tinned, Nos. 18 to 22 " 8½c
Fence Staples per keg 5
Per lb. 6
Iron Rivets.—Black, papered dis 2 &
Tinned, papered dis 2 &
In bulk, new 3-16 7-8c | ¼ 7½c | 5-16 6½c | ⅜ in. dia 6½c per lb.
Tacks.—New Hardware List dis 50
Sad Irons dis 50
Enameled Kettles.—Standard Mfg. Co. 6 25%
Enameled Sauce Pans.
Standard Mfg. Co. dis 40
Enameled Boilers.—Standard Mfg. Co. dis 40
Dripping Pans.—Smooth Iron ₩ ℔ 8½
Geneva Fluters per doz $1.50
Monroe Fluters " 12½
Stove Polish.—Dixon's ₩ gross
Gem per gross
Japanese
Dixon's, in bulk ₩ ℔
Coffee Mills.—Parker's dis 40
Granite Iron Ware dis 40
Spoons.—New list dis 15
Retinned Iron Ware dis 60 & 10%
Plain Stamped Ware dis 60 & 10%
Japanned Ware.—St. Louis List dis
Fry Pans dis
Ware dis

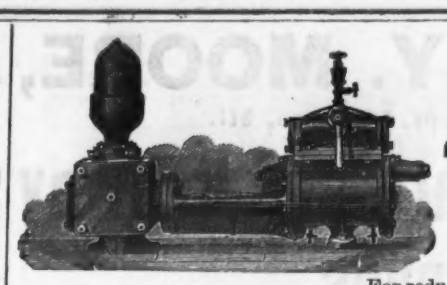
ELEVATORS.

PASSENGER ELEVATORS. FREIGHT ELEVATORS.

Hydraulic Elevators to run from City Pressure.
Condensed Air and Hydraulic Elevators operated by Steam Pump.
Independent Steam Elevators.
Belt Power Elevators.
Portable Hoisting Machines.
All kinds of **Hoisting Machinery** a specialty.

DOUBLE DRUM PORTABLE HOIST.

STOKES & PARRISH, 3001 Chestnut St., Phila.



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"SPECIAL" STEAM PUMP

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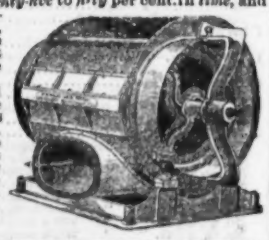
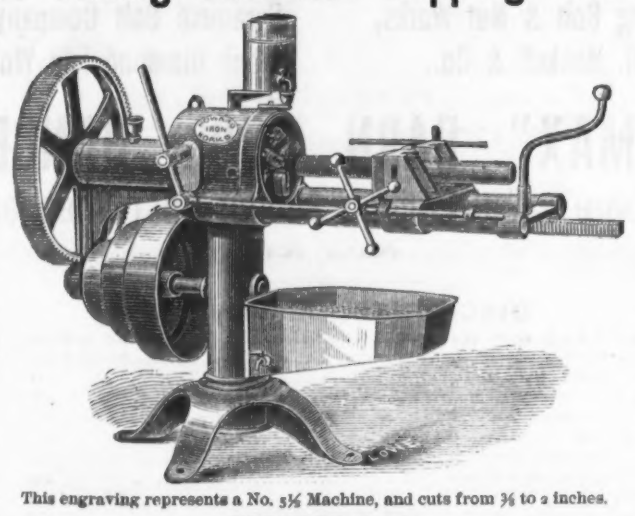
We manufacture these Cupolas of any desired capacity, numbered from 1 to 20, inclusive, the numbers indicating the melting capacities in TONS PER HOUR—No. 1, one ton; No. 2, two tons; No. 3, three tons per hour, and so on up to 15 or 20 tons. We have *improved* the *construction* of these Cupolas in every way, have increased their strength and durability, and sought to make them as convenient for working and repairs as our own, and the experience of our customers, could suggest.





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First Premium awarded at the Centennial Exhibition.

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This engraving represents a No. 5½ Machine, and cuts from ⅜ to 2 inches.

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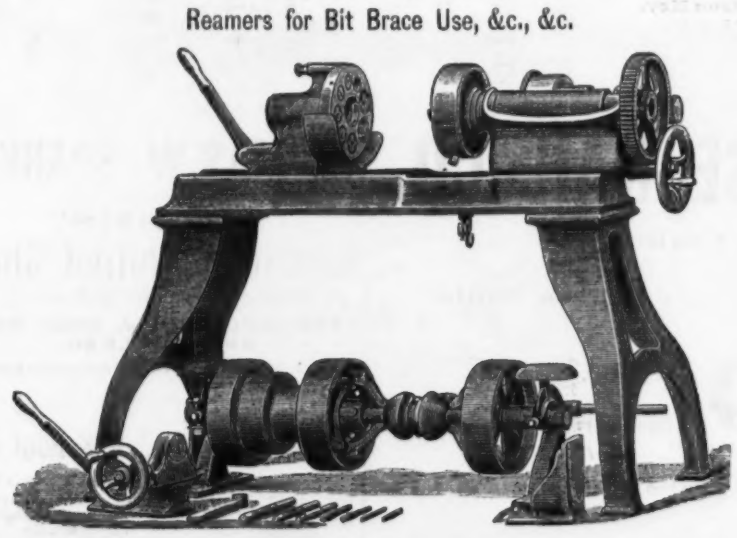

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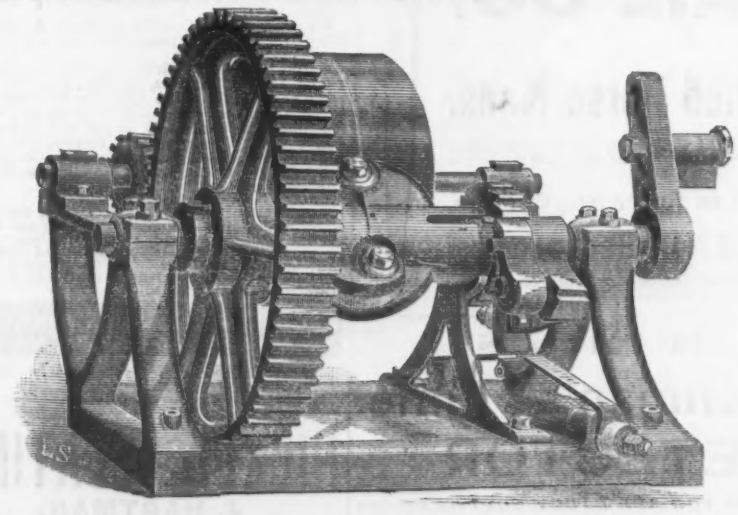

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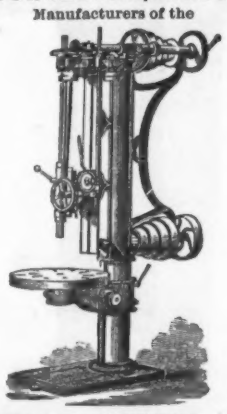

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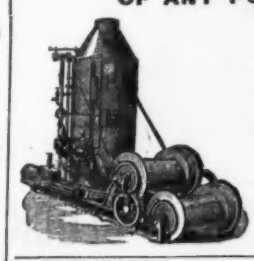

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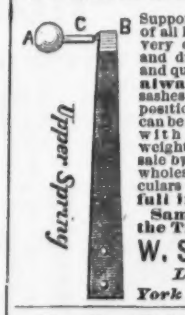

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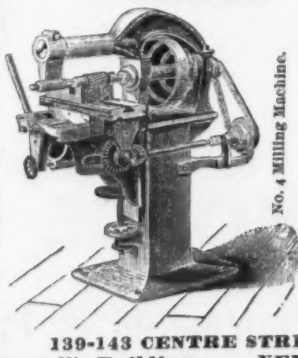

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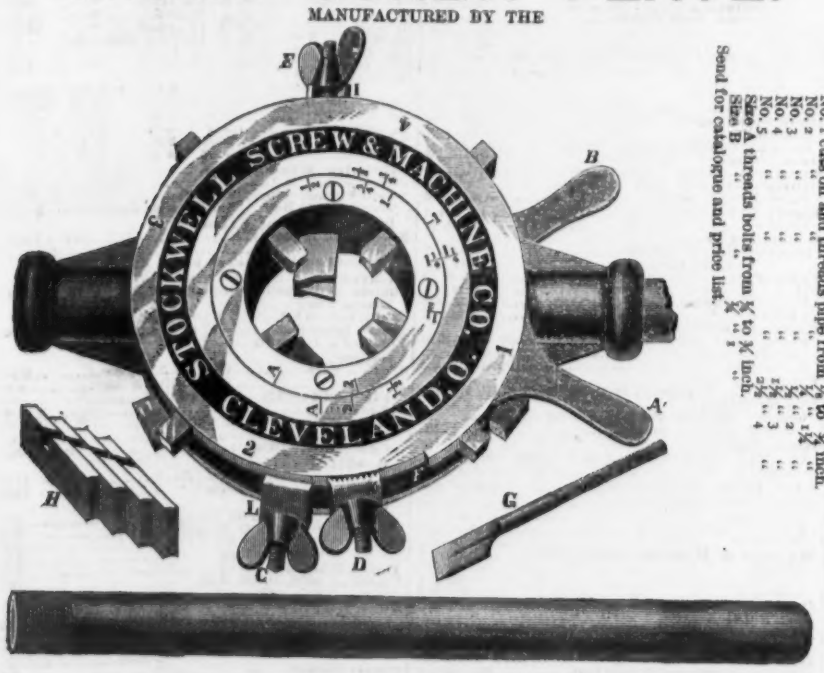
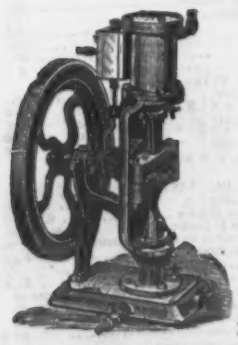


No. 1 cuts off and threads pipe from ⅛ to ¼ inch.	
No. 2	" " " ⅜ "
No. 3	" " " ½ "
No. 4	" " " ¾ "
No. 5	" " " 1 "
Size A threads bolts from ¼ to ½ inch.	
Size B	" " ⅝ " 1 "

Send for catalogue and price list.



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1½	23.00	27.00	2.50	$6.00
2	27.00	31.00	2.75	7.50
2¼	32.00	37.00	3.25	9.00
2½	36.00	41.00	3.50	11.00
2¾	40.00	46.00	3.75	12.00
3	45.00	52.00	4.25	14.00
3½	54.00	62.00	4.50	17.00
4	64.00	73.00	5.00	21.00
4½	74.00	84.00	5.50	25.00
5	84.00	95.00	6.00	31.00
5½	97.00	109.00	6.50	37.00
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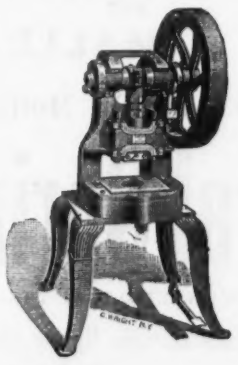

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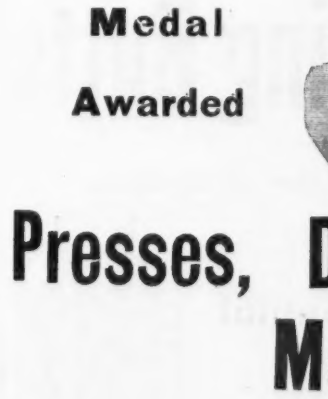

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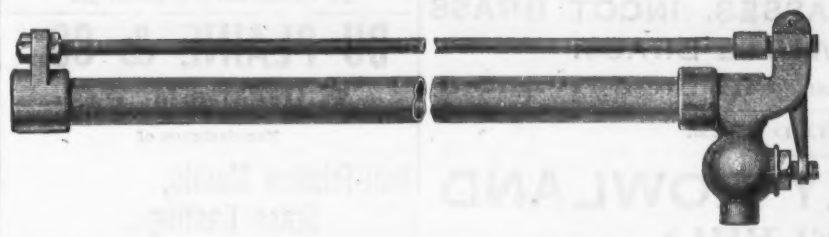

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Suits any Location. Price, $12.

Send for circular giving particulars.

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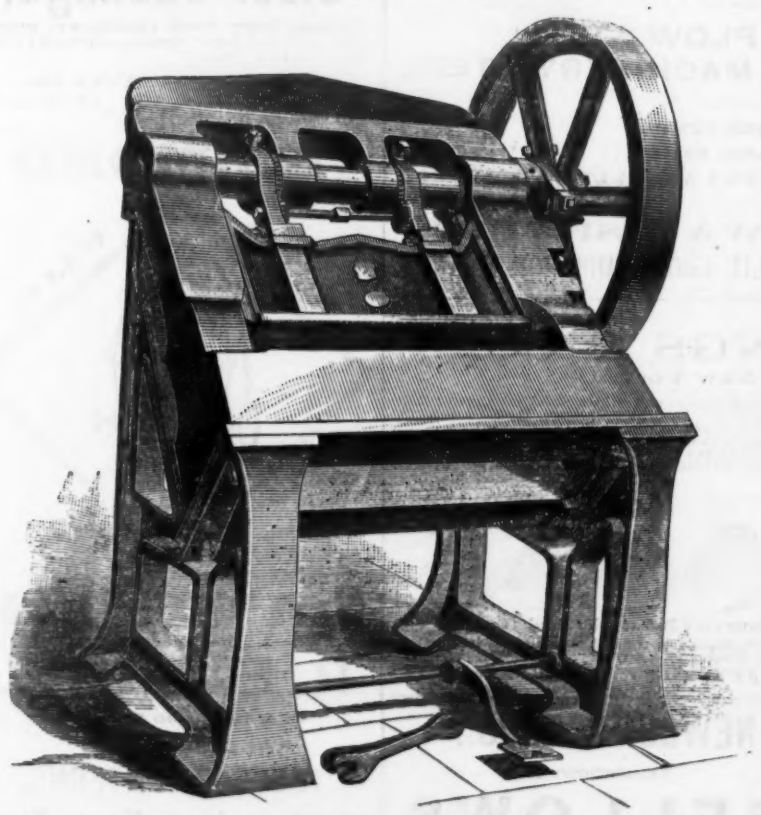

The above cut represents our No. 5 Double Pitman Incline Press. The pitmans being adjusted simultaneously, the slide can never get out of true, as is the case where they are adjusted separately. It is designed more especially for such work as the tops and bottoms of large square cans. Two tops or two bottoms are made at the same time, one on each side of the press. The workman puts in one piece with each hand, and, as the Press is inclined, the finished articles fall by their own gravity. Much trouble has heretofore been experienced in keeping the *slide* of the Incline press in its true position, owing to the wearing away of the under side, by its weight; this difficulty is entirely obviated by our Patent Gib, so arranged that in taking up the wear the slide is always kept in its true position.

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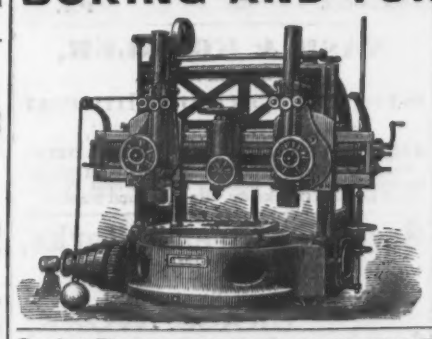

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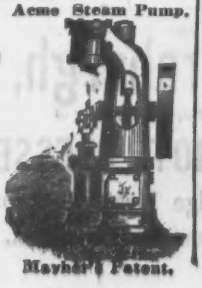

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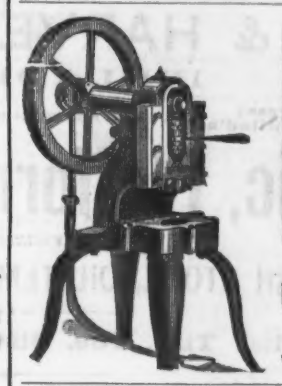

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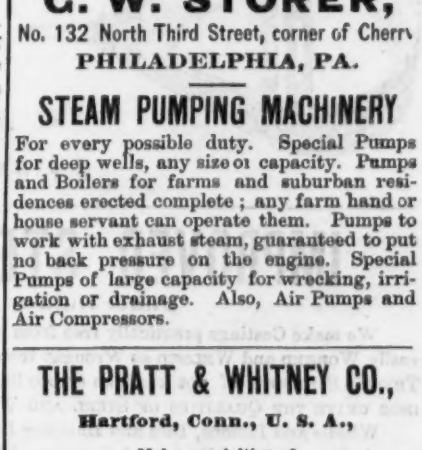

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CAST SPRING AND PLOW STEEL.
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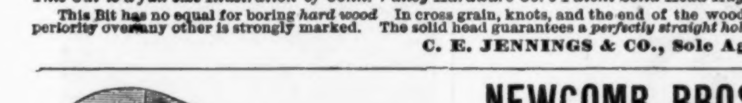

This Cut is a full size Illustration of Conn. Valley Hardware Co.'s Patent Solid Head Auger Bit. 8-16

This Bit has no equal for boring *hard wood* In cross grain, knots, and the end of the wood its great superiority over any other is strongly marked. The solid head guarantees a *perfectly straight hole.*

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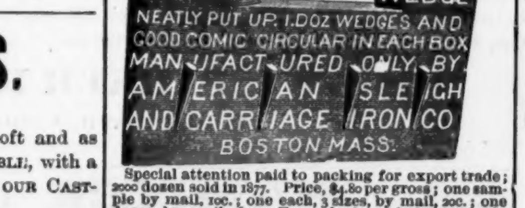

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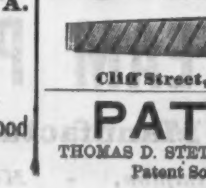

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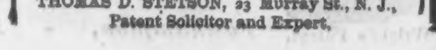

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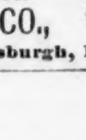

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